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ABSTRACT

Presented in this document, a product of the project on Documentation and Technical Assistance in Urban Schools (DTA), is a series of principles that can be used by members of schools and their consultants to improve the capacity of schools to solve their problems locally. References are made to the complexities of school problems and of human nature that have a bearing on any change strategy. Clusters of variables related to the vicious circle schools are often caught in when trying to reduce multiple or severe problems are discussed in conjunction with variables in human nature that hinder problem solving. Skills and knowledge that are considered essential to a school's capacity for solving problems are outlined and described in detail. Included are communication, diagnostic, and monitoring skills and knowledge of the complexities of humans and their school organizations, knowledge of variables affecting change in schools, and knowledge of the effects of using different sequences of action in change projects. Appended are summaries of research that show the best ways for consultants to assist schools in solving problems. (EB)

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TRANSFORMING PROBLEMS IN URBAN SCHOOLS INTO A CAPACITY FOR SOLVING PROBLEMS

by

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A product of the project on
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PREFACE

This manuscript represents another step in the continuing effort of the program on Strategies of Organizational Change within the Center for Educational Policy and Management (CEPM) to generate a useful theory and technology of school improvement. It is one of several final reports from the project on Documentation and Technical Assistance in Urban Schools (DTA) funded by the National Institute of Education (NIE) through its program on School Capacity for Problem Solving.

Strategies of Organizational Change

Our series of studies began in 1967. Between the summer of 1967 and the spring of 1968 we spent the equivalent of twelve days training the staff of a junior high school to build new organizational norms and procedures for describing its goals iteratively, comparing its reactions with what it would accept as movement toward its goals, generating revised hypotheses about actions that would move the school closer to its goals, making decisions to carry out revised plans, and checking whether movement toward goals improved.

The training began with development of skills in interpersonal communication, moved through strengthening constructive norms in actual work groups, and culminated in establishing new structures for communication among the staff, students, and outside community. That project, which we labeled Organizational Training for a School Faculty, resulted in a first research monograph from our program (Schmuck and Runkel, 1970) and won the Douglas McGregor Memorial Award, presented to us by the National Training Laboratories, for the best study in applied behavioral science in 1969.

The success of our first project led us to attempt to raise the self-renewing capability of an entire school district. In the fall of 1967 we began negotiating with the various sectors of the district concerned and collecting dianostic data. Active training of subsystems began in April 1968 and climaxed in the summer of 1969 with the training of a cadre of organizational specialists, recruited from various district jobs, who would eventually comprise a permanent collegial structure through which organizational consultation could be offered to peers within the district. The results of that project have been reported by Runkel, Wyant, and Bell (1975).

While the massive amounts of quantitative data collected in that project were being processed, Schmuck and Miles reviewed the available work on organizational consultation for schools and edited a compilation summarizing all the summative evaluations done on the topic to mid-1970 (Schmuck and Miles, 1971). At the same time, we mounted a project to test the efficacy of our sort of consultative help for implementing team teaching. In that project, whose field work ran from the summer of 1970 to the spring of 1971, we compared the usefulness of two strategies of consultation for enabling six elementary schools to convert from traditional structure to a multiunit teaming arrangement. Schmuck, Murray, Smith, Schwartz, and M. Runkel (1975) describe what occurred as those six staffs attempted structural change, reporting both detailed case studies and quantitative comparisons of a systematic field experiment.

From 1971 to 1975 we studied the procedures required to establish a cadre of organizational specialists within a school district that had received only a small amount of organizational consultation. Organizational specialists--including Jane and Richard Arends--were recruited among teachers, administrators, and supporting staff and were trained to diagnose organizational conditions, plan interventions, and consult with subsystems within their district to promote creative adaptation. The results of that work are reported in Chapter 12 of Schmuck, Runkel, Arends, and Arends (1977). The DTA then engaged us and CNS from January of 1975 to October of 1978. We are now beginning a research project to discover how students in secondary schools can be enabled to share in the operation of their schools.

The DTA Project

The program on Strategies of Organizational Change at CEPM joined with the Center for New Schools (CNS) in January of 1975 to carry out the project on Documentation and Technical Assistance in Urban Schools (DTA) under a contract between CNS and the National Institute of Education (NIE). NIE had previously granted financial support to schools in nine sites in various parts of the country where schools were showing some success at attacking their organizational problems with local resources, ingenuity, and vigor. DTA's purpose was to study the work at those nine sites, offer technical assistance to still other sites, and find ways to make the lessons learned at the first nine sites (to be called here the "funded sites") available to practice at the further sites. In brief, the intent of the project was to find ways of transmitting knowledge or know-how so that every school need not learn problem solving from scratch.

We at CEPM were happy to join the project because it offered us an opportunity to learn more about making assistance available to urban schools. We had spent nine years testing ways of helping school staffs to help themsleves in problem solving, but we were worried that we were parochial in our views. We welcomed the opportunity to seek methods different from ours in the nine funded sites and in the work of CNS. Since little of our previous work had included schools in large cities, we welcomed the chance to learn the extent to which the methods we had developed in middle-sized cities would be useful in the schools of large cities. We did indeed learn some new things, and they are incorporated in this document.

The DTA began with documenting the events at the nine funded sites. A Site Researcher worked full time at each site gathering information and recording it on Field Data Forms. Site Researchers also wrote interpretive essays. Other staff of DTA got information about the sites from the Field Data Forms, from the essays, from oral discussions with the Site Researchers, and--eventually--from the lengthy case studies of the sites. CNS established consultative relations with schools in Chicago and CEPM with schools in Oakland, California. Both consultative groups strove to move "lessons" from the nine funded sites (and from other experience) to problem-solving efforts at the further schools. Both noted lessons they themselves were learning and wrote reports.

The chief lesson to be elaborated in this document from our consultative experience with urban schools in DTA is that the worries of school people and the difficulties in the way of their problem solving are pretty much the same everywhere, but the difficulties in many urban schools are exacerbated and magnified almost beyond belief.

Connected Writings

This document is only one of several reports issuing from the DTA project. Another is "Organizing for Improvement in Education: Establishing Effective Organizational Intersections" by Arends and Bayliss. In addition, a collection of articles on "Renewing Urban Schools" will appear in a special issue of Theory Into Practice edited by Schmuck, Bell, Francisco, Bassin, and Gross. A number of other reports will issue from our partners in DTA, the Center for New Schools (59 East Van Buren, Suite 1800, Chicago, 60605). They will issue case studies of the nine sites studied by DTA where schools were making systematic efforts to solve organizational problems locally. They will also issue several theoretical and interpretive papers.

Audience for This Document

We present this manuscript to the limited audience of our colleagues in the DTA project, the staff of NIE's program on School Capacity for Problem Solving, and the reviewers that we and NIE selected for their understanding of consultation, problem solving, problem-solving capacity, and urban schools. Ultimately, we hope to publish this document for a wider audience. We have written with the wider audience in mind--namely, those persons interested in organizational change in schools.

Our intent throughout is to deal with theory--that is, conceptions of how problem solving in schools does work, how it can work, and how it can be facilitated by change agents from inside or outside the school. Since we believe, however, that useful theory is valuable not only to organizational theorists, but also to change agents and to the members of schools themselves, we found ourselves writing with all three of those groups in mind. Members of any one group will probably wish we had said more about some things and less about others.

Mode of Exposition

The theory presented here rests partly on the work of others (the literature) and partly on our own. We have cited the originators of some relatively new theoretical ideas, but have not bothered to trace the origins of ideas that have been around so long as to become common property. We refer to data to back up some of our assertions, but do so more to elucidate the nature of our assertions than to convince the reader that the assertions are justifiable. Some of our assertions rest on a great deal of published data; others rest on only a few studies, and a few are hunches stemming from our experience as consultants and researchers. Our primary purpose in this document is to lay out a conceptual argument about the capabilities of schools as organizations. We wanted to avoid interrupting the flow with long reviews of empirical evidence.

That is not to say that the empirical evidence is sparse. The bibliography by Runkel and Burr (1977) contains 479 entries relevant in one way or another to the assertions in this document; 318 of them describe studies conducted in schools. Other relevant references to data appear in Schmuck and Schmuck (1974) and in Schmuck, Runkel, Arends and Arends (1977). Runkel and Schmuck (in press) have sketched the empirical support for a considerable number of conclusions from our own program on Strategies of Organizational Change in CEPM. We believe we have brought together here an interlacing series of principles, well buttressed by research and nowhere contradictory, that can be used by members of schools and their consultants to improve the capacity of schools to solve their problems locally.

Our intent is to offer a point of view, an intellectual scheme, a cognitive map, or--as we call it in Chapter 3--an "image" of present and possible organizational functioning in schools and districts. This document is neither a handbook on how-to-do-it nor a formal theory with axioms, postulates, and theorems. It lies between those alternatives. We have written discursively, almost narratively. Hypotheses abound, but we have not set them forth explicitly by label or list. We hope to produce a more formal exposition in the future; Runkel, Wyant, and Bell (1975, Chapter 3) made a start, but our thinking has gone beyond that beginning. We hope this document will draw critical comment that will help us write more formally in a sequel.

Acknowledgements

All members of our team at CEPM have contributed in some way to this manuscript. Warren Bell, Scott Pengelly, Ann Burr, Janis Clark, and Bettye Williams participated in discussions about its ideas. We are grateful to Milbrey Wallin McLaughlin, Terrence Deal, Karl Weick, Gene Hall, W.W. Charters, Jr., John Packard, Toby Edson, and Marianne Hung for very helpful criticisms of earlier versions.

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Chapter 1

OVERVIEW

Urban schools are beset by myriad difficulties. Their names are legion: declining achievement scores, youth crime, dropouts, and all the rest. When you ask teachers about their problems, the names become more homey: the hallways are too noisy, kids are unruly, the central office makes us go to too many meetings, the kids don't want to learn, other teachers don't maintain standards, and so on. Parents complain: she doesn't want to do her homework, he doesn't bring home any homework, other kids pick on her, he's learning bad things from other kids, and the like. Students say that classrooms are boring, that teachers push them around for no reason, that other kids are mean to them, and so on.

Reducing difficulties in a school requires more than complaints and exhortations to bear down. It requires more than "upgrading" teachers. The difficulties in schools are embedded in the organizational life of the schools. If a difficulty is to be removed, concerted action in necessary. Concerted action is a matter of organizing. Teachers, or whoever is involved, must agree upon a manner of working together that they believe will not give rise to the difficulties that now give them pain. The agreement about the future will have even greater power to produce action if the participants believe the new way of doing things will not merely remove present pains, but will bring frequent satisfactions of successful endeavor, self-management, and friendly relations with colleagues.

More than agreement on goals is necessary. Participants in solving problems must become convinced that a new way is feasible, that they can depend on their colleagues to do their part, that administrators will support the new pattern and join it, that the risks are reasonably assessed and not too frightening, and so on. Finally, occasions must be made when participants can hear one another proclaim their commitment and see one another taking the first steps to bring the new way into being. The business of taking steps to change old ways of working into new is complicated and risky, not simple and safe. If the interpersonal dynamics of change are ignored, the whole effect can be wasted.

Furthermore, solving problems in schools often involves technical matters. Sometimes changes call for altered modes of teaching, knowledge of legal requirements, knowledge of the availability of certain kinds of specialists, and the like. If the need for new knowledge or skill is ignored, the whole effort can again be wasted.

Deliberate change that requires concerted effort also requires skillful management so that the efforts of individuals are indeed brought together productively, not scattered and wasted.

What can be done when so many different conceptions of problems are held by members of school and community? How can people come together in a common effort? When will they be willing to risk new forms of action? How can serious organizational problem solving be managed? And in the end, how can a school develop a sustained capacity for solving its problems? Those are the questions to which this document offers some answers. The answers are not as detailed as we would like, nor are they the last and best answers that will ever be put forward. But we think they will be helpful to many.

The chief purpose of this document is to explain how we think a sustained capacity for solving problems can come about in schools. By a sustained capacity, we mean merely a continuing ability to deal productively with whatever kind of problem comes into view. Naturally, all schools do deal with problems in one way or another, but our observations in schools convince us that most schools use up a great deal of energy in unproductive ways. Schools often flounder through problems instead of using a systematic procedure that (in our experience) can save time. Schools sometimes put the wrong people to work: they give a problem to a group when almost everyone is willing for a solution to be chosen by the principal or the school's secretary, or the principal imposes a solution to a problem that in fact requires the initiative and commitment of groups. Schools sometimes undertake to solve within the school a problem that cannot be solved there. Schools sometimes expect to solve a problem once and for all when, in the nature of the case, work on the problem must be re-cycled year after year. Schools sometimes use methods that alleviate one problem only to make others worse. Finally, schools often engage in "fire-fighting"--they try to cope with a great many very difficult problems at the same time by trying to stop-gap one after another. All those ways of coping with problems are understandable, but the waste of effort is profligate. When we speak of sustained capacity or dealing productively with problems, we mean ways of working at problems that avoid those wastes and that enable participants to devote greater parts of their energies to the rewarding parts of their jobs. The rest of the document elaborates the concept.

Coordination

When we say that concerted action is necessary to solve problems productively and that some convergence on goals is necessary, some readers may wish to connect us with one or another school of thought on the matter. We take some space, therefore, to describe more precisely where we stand.

We cannot think of a task that has effects in the real world (that is, outside the head of an individual) that can be performed without any coordination at all with others. Even if a person goes out alone to dig a hole for a fence-post, some coordination beforehand and afterward is necessary. The spouse will want to know that the digger has not chosen supper-time to do the work, and the neighbor will want to know that the hole is on the digger's own land.

Going on to more obvious examples, a group of musicians must sound certain notes at the same time. A football team must block and pass in the right places and with the right timing. Members of a curriculum committee must, more often than not, gather in the same place at the same time, and each must deliver his or her part of the work within reasonable time limits. A teacher must (or should, according to most learning theory) answer a student's question now, not a month from now. The need for coordination of that short-term sort seems to us unarguable. But short-term coordination requires some longer-term agreements, even if the longer-term agreements are less detailed and more changeable than the short-term. If the group of musicians is to sound notes at the same time, they must agree on the piece of music they will play. To agree on that, they must agree upon their intention to play something together and to spend a series of sessions practicing together. Practice schedules can be revised, the repertoire can change, and members of the group can be replaced, but the notes cannot be sounded together until the common intent and the mutual understanding of actions to be taken become sufficient to bring together the players, instruments, and music.

In the past, some managers and theorists seem to have supposed that an organization would work best if all actions of all sorts in all parts of the organization were as tightly linked as those of the players in a string quartet.* The view was typified by the "scientific management" of Taylor and persists in such methods as program planning and budgeting systems, management by objectives, and evaluating a program of work only by comparing the program's outcomes with the objectives stated at the outset. We certainly do not concur in such a clockwork view of organizational behavior.

Recently, some writers have been pointing to the looser side of organizational functioning; for example, Glassman (1973), Hedberg, Nystrom, and Starbuck (1976), March (1976), March and Olsen (1976), Meyer and Rowan (1975, 1976), Pondy (1976) and Weick (1976). Those writers point out that there are some large gaps of control in schools and other organizations, and that those gaps maintain some important and desirable freedom of action for the organization's members. The gaps permit the diverse inventiveness of the members to be brought to bear on problem solving as circumstances change, in a manner analogous to the way a gene pool enables a population of living creatures to adapt to a changing environment. Those authors also point to the necessity of continually re-cycling goals and to the fact that a great deal of work gets done in organizations despite the fact that many members have very disparate views of what the organization should best be doing. The larger courses of action in a human organization (in which a string quartet, for example, may be embedded) are "loosely coupled."

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*Excluding aleatory music, of course.

When we say that getting work done requires coordination and agreement on how to do things, we do not mean that people must swear undeviating commitment to long-term goals, short-term goals, and all the myriad small steps for reaching them. We mean only that there is inevitably some minimal orderliness in what people expect from one another today, next week, and next month. Planning in a group, for example, probably yields its greatest benefit when it enables people to test the trustworthiness of those expectations. Dowling (1978) recently interviewed Fletcher Byrom, chairman of the board and chief executive officer of the Koppers Company. Byrom said:

> We do quite a bit of [long-range planning] ourselves. . . but to us, it's a discipline more than it is a guide to future decision making. . .If you have taken the trouble of anticipating something, you should at least be able to recognize that it hasn't happened that way. If you hadn't done the planning, you wouldn't have realized that what happened was unexpected. As a regimen, as a discipline for

> a group of people, planning is very valuable. My position is, go ahead and plan, but once you've done your planning, put it on the shelf. Don't be bound by it. Don't use it as a major input to the decision-making process. Use it mainly to recognize change as it takes place (p. 40).

Our view of goal-setting, planning, making agreements, and other processes of coordination is much closer to Byrom's than it is to the view inherent in program planning and budgeting systems. Weick (1969) has said the same thing as Byrom in different words:

> It is the reflective glance, not the plan *per se*, that permits the act to be accomplished in an orderly way. A plan works because it can be referred back to analogous actions in the past, not because it accurately anticipates future contingencies (p. 102).

When people in a school make agreements for the near future, they test the features of their past behavior that others can imagine themselves welcoming in the future--and the features others want replaced by something else. Teachers may agree, for example, to turn in attendance sheets to the school's office by 9 a.m. A teacher may then fail to do so. And when a teacher does fail to do so, we do not mean to say that the operation of the school must then grind to a halt. We do not mean that a school can operate only if coordination is detailed, tight, unvarying, and intolerant of exceptions. We mean only that humans will always demand some minimal degree of predictability from those with whom they work. The previous agreement among the teachers legitimizes taking note of the tardy teacher and opening a discussion of the tardiness. The discussion may or may not eventuate in demanding conformity of the teacher to the previous agreement.

Manifestations of Problems in Urban Schools

To us, a problem is more than a frustration. Life is full of frustrations; we do not take all of them to be problems to be worked on. Some of them go away by themselves, and we suffer some that don't go away as minor irritations. Part of a skill in solving problems is the judicious selection of frustrations to be made into problems. In our view, people are likely to flounder in frustration interminably until they explicitly conceive a problem as a gap between a specified undesirable present situation (what do I want to get away from?) and a more desirable specified future state of affairs (where do I want to go?). In Chapter 2, we tell more about what we mean by a problem and a little about its anatomy. In Chapter 3, we outline a systematic sequence for solving problems.

But urban schools have a surfeit of frustrations from which to choose problems. One need not visit a typical urban school for more than a few hours before becoming appalled at the onslaught of difficulties, impediments, and frustrations with which members of the school must labor day after day. In our view, indeed, most urban schools are caught in a vicious circle of overwhelming difficulties and incapacitation. In Chapter 2, we portray the vicious circle. It is the rank and pullulating soil from which rise the most fractious problems of urban schools.

Both the matter of conceiving problems and the vicious circle of overload and incapacitation suggest variables that must be altered if a school is to achieve a sustained capacity for solving problems. We are more specific about the variables in Chapter 5.

Humans and Organizations

The chief "material" with which problem solvers in a school have to work consists of the people in it (and around it). And naturally, workers do better when they understand the characteristics of the materials they are working with. Carpenters who are ignorant of the behavior of grain in wood will often find that they have split a board and weakened the structure. We believe that problem solving in schools often suffers severely because the leaders of change projects have mistaken or over-simple notions of the ways that humans and their organizations function. We do not claim that problem solving will necessarily improve if administrators and other members of schools have a thorough and sophisticated knowledge of the potentialities of humans and their organizations. We do claim that over-simple conceptions limit the choices that people can make.

The "material" with which problem solvers work has two aspects to it. One is the individual aspect; humans show certain patterns of functioning as single individuals. The other is the organizational aspect; a school shows certain patterns of functioning as an organization, and the patterns are not the same as those of individuals.

For example, many people believe--or at least they act as if they believe--that humans will do something at work only if they are pushed or threatened into doing it, and they will do it right only if they are closely watched and corrected by someone else. This theory of human nature seems to imply that there are two kinds of people in the world: those who must be pushed and those who do not need to be pushed, but do the pushing. And somehow the former are always found in subordinate positions in organizations, and the latter in the bossing positions. Yet the fact is that almost everyone gets to be a boss by being promoted from a subordinate position. Apparently part of the theory is that a person promoted to a bossing position becomes self-motivating in a transformation as sudden as that of the frog kissed by the maiden. It seems to us simpler to theorize that pushing and being pushed are a consequence of the norms surrounding positions of authority and subordination in most organizations rather than a consequence of human nature. Indeed, we believe humans to be inherently active, self-motivating, creative, and capable of unending varieties of conceptions of the world they live in. We will describe our view more fully in Chapter 3 and explain the implications for managing problem solving in schools.

Similarly, the marvelous complexity of a human organization such as a school seems surprisingly little appreciated. For example, some people seem to believe--or at least they act as if they believe--that a school's troubles will disappear or greatly lessen if it is injected with money, just as an automobile engine will automatically go faster if it is injected with gasoline. Others believe that a school will operate better if its worn-down parts (teachers, for example) are replaced by newer and shiner ones, or if the parts are "upgraded." Others believe that a good school can be put together by following the blueprint of some other school that they admire. Others plead for new goals: new "blueprints" of an ideal school that does not now exist. We do not say that those notions are wholly wrong; we say they are over-simple. Our own view of the school is that it is complexly built of subsystems and inherently multiply motivated, full of complex images of itself and its environment, full of creativity, subject to conflict that arises naturally from the creativity of its members, and subject also to conflict that arises naturally from its members' differing impulses under threat. We will elaborate on our conception of the school and its implications for solving problems in Chapter 3. We also treat the understanding of humans and their organizations as variables in Chapter 5.

Because humans are creative and because they differ in their conceptions of the world around them (including their theories about human nature), we believe that concerted work on problems in schools cannot often be brought about by administrative fiat. Neither do we believe that it can very often come out of undisciplined confabulation of the town-meeting sort. Because of the very diversity of humans' images of themselves and the world they work in, we believe that problem solving can move along reliably only if the problem solvers agree upon some systematic procedure. We propose a procedure for that purpose in Chapter 3.

Meta-skills

Effective problem solving in an organization requires skills of many sorts. One sort of skill that we believe essential is usually given little or no attention in schools; namely, the skill of watching the process of problem solving itself and taking steps to maximize its effectiveness. Distilling many of the ideas from Chapters 2 and 3 into their most active components, so to speak, we arrive in Chapter 4 at four watching-and-maximizing skills that we call "meta-skills." The four meta-skills are of great aid in solving any problem, but, beyond that, we believe they are essential to maintaining a strong capacity for solving problems in the school, whatever the problem, year in and year out. The four meta-skills are: (1) diagnosing the functioning of group and school, (2) gathering information and other resources from within and from outside, (3) mobilizing synergistic action, and (4) monitoring the other three meta-skills. A school with high levels of those skills, we believe, can deal productively with any difficulty whose chief sources do not lie outside the school's power to affect. In Chapter 4, we explain the meta-skills in some detail and give examples from experience. The four meta-skills are included as variables in the list in Chapter 5.

Variables

When a problem-solving group decides that a solution will require change in norms and role-relationships the steps toward the solution must be carefully designed if they are not to falter. Norms and role-relationships not only provide predictability in an organization; they also provide a feeling of security to its members. When norms and role-relationships begin to change, it is inevitable that members of the school will feel threatened, some more than others. Indeed, when members of schools hear that someone is planning to change norms and role-relationships, they feel to some extent threatened even by the intention. We describe the sources and effects of the threat in several places in Chapters 2, 3, and 4.and suggest ways the threat can be avoided. Designing change so that participants can minimize their risks and anxieties is the topic in Chapter 5.

Chapters 2, 3, and 4 discuss a number of variables (though without calling them that) we believe to have strong effects on the likelihood of successful problem solving in urban schools. We list those and others in Chapter 5 as a kind of check list to aid change agents (whether insiders or outsiders) in their planning. We point out that some of the variables that affect change have strong connections one with another (cooperative tasks raise trust among participants, for example), and some do not. For that reason among others, a certain amount of phasing is required in the schedule of a change project so that dealing with certain variables in one phase helps participants to deal with other variables in the next phase. We lay out a series of phases that we think can be useful in designing a long-term project to improve capacity for solving problems in an urban school. The phases can be truncated, of course, for simpler projects.

Not all difficulties lie within the school's power to reduce them. Some arise in the school's environment where their sources are beyond the reach of the school. Perhaps the most obvious is the legal requirement that all youngsters of a certain age must show up at the school, and the school must take them in. Another obvious one is acute or chronic shortage of money. And so on. Difficulties of that kind must be resolved by the society at large or by institutions within it other than the school. However, even though the wider social environment thrusts very difficult problems upon urban schools, we believe there is still enough freedom to act in most so that conditions in the schools can be significantly improved by the people in them.

We believe our recommendation of collaborative work in schools is the best way to cope with problems. We believe, too, that our theorizing about how to focus that collaborative work is a part of a general trend of thought throughout the world, reshaping not only education, but many other realms of life. When the group in the National Institute of Education through which the DTA was funded included the words "local problem solving" in its first name for itself, it was bucking an ancient authoritarian mode of life, but it was also joining in the world-wide experimentation with local self-management, with fuller exploitation of local resources, and with the ways humans can help one another to live more humanely. In this ecumenical spirit, we end our document with one quotation from an industrial psychologist and another from an economist. Their visions of the future of their own realms of activity match our own visions of the future of schools.

Chapter 2

MANIFESTATIONS OF PROBLEMS IN URBAN SCHOOLS

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Chapter 2

MANIFESTATIONS OF PROBLEMS IN URBAN SCHOOLS

Though we devote this document chiefly to conceptual matters, we want frequently to remind ourselves and the reader of the realities to which we hope our concepts correspond. In that spirit, we discuss two topics in this chapter. One is a conception of "problem." The other is a picture--we believe a realistic one--of self-aggravating frustrations and impediments we have seen repeatedly in urban schools.

Converting Frustrations into Problems

When we listen to urban educators discuss their frustrations, we hear them say or imply that they would prefer something to be different. They sound as if they find something unpleasant about the current state of affairs and as if they believe some alternative state of affairs would be more pleasant. Often, however, they are not able to specify the features of that better state of affairs. From our point of view, urban educators who primarily complain about the present without conceiving a better alternative have not yet conceived a problem and are therefore not ready to solve a problem.

Life is full of frustrations. You may not enjoy driving ten miles to work every morning, but if you accept it as a reasonable price for living in a neighborhood you want to live in, it is not a "problem" in our sense. It is not something you are motivated to solve. Since the topic of this document is that of solving problems, we want a concept that opens the door to doing something that is different from what you are doing now.

We will use the word problem to mean a discrepancy between a present state of affairs and a more preferred state of affairs--sufficiently more preferred that one is ready to spend some energy to get there. Without the two parts--the current situation and the more desirable one--a problem has not been specified. Frustration, irritation, anger, or confusion is often a feature of a problem--part of the present state of affairs--but it is not in itself a problem.

It is, of course, typical that most people feel frustration, irritation, or anger before they can put a discrepancy into words, because those feelings are typical symptoms of underlying problems. But not all disgruntlements are worth converting into problems. Most of us, almost without thinking, make a judgment about whether a frustration is worth an investment of energy to remove it or whether the frustration will remove itself in the natural course of events.

Often, a frustration does indeed signal a problem worth working on. It is a profitable habit to give at least a little thought to any feeling of frustration that does not go away in a few minutes or an hour to see whether an important problem might be lurking under it. It may be that the source of the frustration is not the condition most evident to the eye when the feeling of frustration arises. It may be that the problem more worth working on lies elsewhere. For instance, if a teacher feels frustrated by the application of a school policy and is unwilling to discuss it with the principal, the problem worth working on may not so much be that of the teacher's lack of willingness to confront the principal, but instead may be the absence of a group norm in that school enabling all of the teachers to feel free to describe their frustrations to the principal. That is, while the feeling of frustration itself, being a psychological condition, lies within the teacher, the proper place to conceive the problem and to solve it may not lie inside the teacher; it may lie instead in the interpersonal skills and norms of the school staff.

Finally, it should be clear that our concept of problem puts the problem inside people's heads, not in the real world. When someone says that a school has problems, that means to us that some people in that school react to the state of affairs there by wishing they were different. But different individuals in the school may have very different "images" in their heads of the present state of affairs, the more desirable state, and the steps necessary to move from the one state to the other. The implication is obvious: one of the first steps in problem solving is to ascertain with some precision the images the people concerned have of the present state of affairs and the alternatives. We will say more about images in Chapter 3.

Problems Entail Human Values

The problems of urban educators do not have a reality separate from the values of individual people, of groups, and of school organizations. Values affect the ways people see the present state of affairs, they put strong shape on the states of affairs people feel to be desirable, and they restrict the steps people are willing to take to get from the one to the other. People may value individual autonomy, cooperation, human affection, striving and achievement, artistic expression, the will of God, new thrills, orderliness--the list is endless. But a frustration becomes a problem when a target state can be imagined that satisfies one's values more than the present state does.

Start With the Participants' Own Problems

Even though many urban educators, caught in their frustrations and tensions, may not sound very rational or articulate about their problems, the proper starting point for school improvement is their problems, not the problems that may be conceived by social scientists or other outsiders. Action can spring only from the reality perceived by the educators themselves who will be carrying forward the solution of a problem; they can act only on their own conceptions, not someone else's. (There will be more on conceiving and acting in Chapter 3.)

Under appropriate circumstances and after an appropriate period of time during which one alters one's view, one can adopt someone else's view of reality. But present action can start only from the present image of reality of the educator in the school. It is essential, therefore, that the frustrations of the urban educators themselves (and students and parents, as the case may be) serve as the launching pads for the specification, analysis, and solving of problems.

The Anatomy of Problems

School participants perceive a problem--in our use of the term--when they perceive a discrepancy between what they diagnose to be actually happening in the here and now and what they would prefer to be happening in the future. Whatever the degree of discrepancy, optimal problem solving occurs as those who perceive troubles are motivated to do something productive about them by designing proposals and then by taking action. Along with awareness of a discrepancy, "having a problem" also means contemplating change and taking action. The person or group with a problem is energized to move from the present state of affairs to a happier, more satisfying state.

From this point of view, a problem has three aspects: the present situation, the valued state or target, and the proposals or paths that might be taken to reduce the discrepancy between the present and the desired states. Any of the three aspects may be unclear when school participants first feel a frustration. A problem begins to take shape when participants begin to conceptualize situations and targets and explain their images of them to one another. Participants become energized when they can conceive alternative proposals to bring the situation closer to the target. Achieving clarity about the three aspects of problem solving is necessary for effective group action.

We will set forth an outline for systematic problem solving in Chapter 3. We will include skills in conceiving problems and solving them as variables in Chapter 5. In the next section here, we turn to the "real world" of the kinds of problems perceived by people in urban schools.

Problems Perceived

What problems do people see in urban schools? Using labels for the present conditions they would like replaced by more desirable conditions, many would point to the crisis conditions of poverty, youth crimes, and vandalism. Others would speak of insufficient discipline and declining achievment scores. Still others would comment on the evils of unionism or of the archaic tenure system. Another group would point to the domination of middle class whites in what have become largely black or chicano schools. The list of unhappy conditions people would like to replace seems endless.

Our experience in studying the nine sites of the DTA, our experiences in consulting with further schools in DTA and elsewhere, and our reading of the literature leads us to believe that urban educators focus their attention on certain types of problems much more frequently than others. The problems seem to us to fall into three domains: (1) instructional improvement, (2) action between school and community, and (3) getting information and other resources. We give below some examples of successful actions taken to solve problems in each of those domains. The examples are all taken from life. We give these examples to try to make more concrete the kind of action we have in mind when we write about solving problems.

Instructional Improvement

Most urban teachers experience an acute lack of gratification from teaching urban youngsters. Though many of the teachers reach out defensively for rationalizations to explain away instructional ineffectiveness in urban schools, many do confess in their more sober moods that they are at a loss to know how to proceed. Urban districts across the country have tried many kinds of curriculum development, staff development, organization development, "back to basics" programs, alternative schools, and other change strategies to improve the quality and impact of instruction. Millions of federal dollars matched or supplemented by millions of other dollars in state and local taxes, have gone into the efforts. Some districts, including ones we have worked with in the DTA, have aimed their chief energies at improving achievement in basic skills. Other efforts have been directed at increasing urban students' self esteem or at decreasing alienation from school.

Many urban schools that we have studied offer examples of how problems in the domain of instructional improvement can be handled:

> Offering assistance in instruction. In a number of urban elementary schools, efforts are being made to bring teachers' strategies in line with the idiosyncratic needs and styles of individual youngsters. In one effort, open-education advisers work inside the classroom to coach teachers in implementing innovative teaching methods. The advisers work alongside the teachers, modeling appropriate teaching strategies and offering feedback to the teachers as they try them.
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> Enlisting teachers to plan instructional improvements. A systematic process to support instructional improvement is now being tried in a number of urban high schools. A teacher-coordinator works part time to bring colleagues together as a planning committee to diagnose, plan action, implement new programs, and to evaluate the effects. The planning committee solicits short proposals for instructional improvement projects from colleagues, seeks funds from foundations or the district office to support the projects, works closely with outside consultants when appropriate, and evaluates the effectiveness of each project.
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> Responding to professional needs of teachers. Attempts to upgrade the instructional skills of teachers have typically emanated from outside the school. In one DTA site, however, a junior high and three elementary schools were clustered together to form a teacher center that is run by the teachers and that is geared to respond to their professional needs. A coordinating board made up of teachers and administrators from each of the schools plans, implements, and evaluates the offerings of the teacher center. Teachers make suggestions to the board about programs or materials that would be helpful to them. The center is physically located in the junior high making it readily available to the junior high teachers and accessible to the elementary teachers of the three feeder schools.

When we describe the above examples and those to come as successful, we mean only that the methods used did, in our judgment, move the participants away from the conditions they did not like and a good distance toward conditions they sought.* However meritorious the examples may be, we do not mean that in themselves they are evidence of a continuing capacity for solving problems. We mean only that (1) they illustrate the kinds of sub-projects that might be found in a school with a continuing capacity for solving problems, and (2) they are typical of the successful problem solving we have seen in DTA and elsewhere. They are not the most impressive instances nor the largest in scope; they are simply typical.

Action Between School and Community

For the past decade or so, parents, businessmen, politicians, and others have been much more ready to take action concerning their schools than they were previously, and school people are increasingly trying in planned ways to work productively with those active persons in the community. Many examples of school-community action appear in the urban schools we have studied. The following vignettes illustrate problems people in those schools perceived to lie between themselves and the community and some things they did about the problems.

> Coping with student alienation. A group of teachers and parents banded together to make school a more satisfying and relevant organization for students who were "turned off" to school. One

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*We do not give longer descriptions of projects or evidence for our judgments of success, because our purpose here is to illustrate, not to demonstrate. Other publications of DTA provide accounts of projects.

of their creative activities involved working with other adults in the neighborhood who had agreed to act as foster parents and tutors to alienated students. Several group homes for students were established, a number of foster parents were enlisted, and funds were obtained by the teacher-parent committees to pay the adults for their educational services.

Obtaining funds from a foundation. The neighborhood board of an urban elementary school, made up of parents and teachers, established a day-care center so that parents might have some time to become more directly involved as assistants and tutors in the school's instructional program. The board first formed a subcommittee that sought information about the availability of foundation funds. The subcommittee prepared several proposals, and eventually succeeded in obtaining funds. The board then purchased an old house near the school, enlisted volunteer assistance in renovating the house, and developed their parent-run day-care center.

Coping with declining funds and a reduction in staff. A formal teacher-parent group within an urban junior high, when faced with a reduction of funds and a command from the district office to reduce the number of teachers in the school, came up with some proposals so that the school's program would not be hurt. The teachers and parents supported one another, did not immediately bend to the demands of the district office, and were able to save some of the school's strengths even in the face of drastic budget cuts.

Coping with low student achievement. In an urban elementary school near a large housing development, concerned parents, teachers, and administrators organized to bring a sense of pride and intellectual achievement to the school. Through retreats and workshops, during which outside consultants were employed, the parents and educators designed ways of raising the reading achievement of the students. Their design called for each student, teacher, and parent to prepare a joint contract for achievement. The program could not have been energized without the committed cooperation of both parents and educators.

The interface between community and school will be a source of problems for years to come. We see evidence of the concern in such books as that by Jones and Jones(1976) on "shaking up your children's school" and in other writings such as those cited in the bibliography by Davies (1974). We see it also in the numerous organizations that encourage closer action between school and community such as the Institute for Responsive Education in Boston, Massachusetts; the Parent Partnership Program in Philadelphia, Pennsylvania; the Center for the Study of Parent Involvement in Berkeley, California; and the National Committee for Citizens in Education in Columbia, Maryland.

Getting Information and Other Resources

Many people in urban schools and in their surrounding communities are coming to the opinion that the resources they have at hand are simply inadequate to cope with the problems they see. Considering the multiple and severe difficulties in which urban schools are entangled, that opinion is a reasonable one. It gives rise to a large class of problems--that of getting additional resources.

Several kinds of resource come quickly to mind. One is money. Another is person-power, which can sometimes be bought with money and sometimes not--volunteer aides, for example, are often willing to perform tasks on part-time schedules that paid people would not accept. A third kind is knowledge or information--about teaching, using money, using person-power, conceiving and working on problems, organizing, and so on. A fourth resource is access to other resources; its use is exemplified in a question like, "Do you know somebody in the central office (or in the city council, legislature, or federal bureaucracy) who could help us with this?"

Classifying resources satisfactorily is not easy. No matter what classes one chooses, they seem to overlap. Foa and Foa (1974, p. 125 ff.) citing a great deal of empirical evidence, make a good case for the usefulness of conceiving six classes of resources: information, status, affection, service, goods, and money. Maintaining a properly reciprocal exchange of those resources is always important. Indeed, too much of an imbalance puts stress on the fabric of a school's organization. Examples are the teacher who is paid too much more than anyone else or the teacher who receives too much more love from students than any other teacher. Maintaining a proper balance during problem solving and change is especially delicate and important. We touch upon the dynamics when we discuss social motives in Chapter 3, but we leave a thorough treatment of resource exchange in schools to some other time.

We turn again to schools we have studied for some examples of the search for resources.

> Money. After a workshop on parent involvement, the workshop leaders visited with the music specialist. The music specialist had participated energetically during brainstorming activities and was known as an advocate of improved instruction for children. But when the leaders asked her what major problems they might help her solve, she replied that she had only one "perhaps unsolvable" problem: Where to get money to buy instruments and sheet music for her program.
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> Person-power. There are many examples of urban schools where people defined their major problem as a shortage of human resources. In those schools teachers grumbled about large class size, or parents asked for more counselors or nurses than the school was providing. In many ways, those same people indicated that what bothered them was not only a shortage of trained bodies in the classroom, but also the lack of high morale and energy among the teachers, administrators, parents, and students who were already part of the school.

Knowledge. Getting knowledge about effective school practice and using it is much discussed these days. On the one hand, it is hard to show that teachers, administrators, and parents are eager to reach out for knowledge. In fact, teachers are not avid readers of either professional or nonprofessional materials. On the other hand, some evidence suggests that educators see printed information as a resource worth acquiring. An example of that evidence is a story told to us by an urban district-office administrator.

The administrator's office staff had prepared a packet of new curriculum guides for each principal and planned to distribute copies to teachers at a later time. The teachers' copies were stacked in a storeroom near the principals' meeting place. At the end of the day on which the principals met, the administrator entered the storeroom to find the shelves well picked over and nearly bare. "Evidently," she said, "those guides are as precious as gold, because we've been robbed."

Recurring Problems

Some kinds of problems recur repeatedly in one form or another. The three kinds we have illustrated above recur. It is not likely that teachers will cease in the near future to hunt for ways they can improve the effectiveness of their instruction. It is not likely that relations between school and community will satisfy either party very soon. It is not likely that most school staffs will soon give up their search for additional resources.

We will come upon other recurring problems as we move through the chapters and sections. In the next section, we will see a problem in the discrepancy between the present overload of innovative projects in urban schools and the number educators there feel they can reasonably carry forward. In Chapter 3, we will discuss the insufficient degree to which most schools satisfy the basic social needs of the people in them. In Chapter 4, we will describe four "meta-skills" that are almost always too low in urban schools to maintain good ability at problem solving. Since low problem-solving skills impede progress toward solutions, the gap between the existing level of skill and the level that would enable the goal to be reached becomes a problem in itself. In Chapter 5, we will list variables that affect organizational problem solving. A too-high or too-low level of any variable can become a problem.

The multitudinous problems that urban educators strive to alleviate seem to us to be mostly variations on a few recurring themes, despite the fact that specific problems come in many different sizes, with many different casts of characters, connected to many different work-tasks, and described in many different vocabularies. Educators do not often describe their problems in the terms we used in the paragraph above, nor do they ordinarily like to think they are working to solve a problem of a kind that will continue to plague them throughout their careers. Nevertheless, we hope to show in this document that there are several important persisting conditions in today's urban schools that give rise repeatedly to whole families of problems.

The problems we used as illustrations earlier are rather typical of problems educators and their allies choose to work on. We deliberately chose some that seemed to us to reach successful solutions. Looking back at them, they seem to have some features that aided their success. First, the targets of the change efforts were almost always cast in terms easily understood by most persons who were available to work on the projects.

Second, the current undesirable situations were fairly obvious and easy to fathom. Third, the participants believed the targets could be reached or adequately approximated in a few weeks or months--not years. And fourth, the work could be done by a small number of volunteers banding together in a temporary unit--very few of the projects were intended to affect a whole school, not to speak of a district. In brief, the problems chosen could be conceived with little subtlety and could be alleviated by a handful of volunteers in a reasonably short period. We return to this point in the sub-section of Chapter 3 entitled "Shifting Up."

Unfortunately, many of the frustrations of urban educators arise from complex underlying conditions that require sophisticated descriptions. To alter those complex conditions requires conceiving a target that is not specific to an immediate frustration, but calls for an alteration in the underlying conditions. Altering the underlying conditions, in turn, may require several years of work and may require changes of behavior on the part of almost everyone in the school.

We will devote Chapter 3 to the complexities of underlying conditions in schools and Chapter 4 to four "meta-skills" that can effectively alter them. In the meantime, we return in the next section to a very important feature of urban schools--a feature that is not underlying, subtle, or hidden, but is obvious to anyone who visits an urban school for an hour or two--the unremitting onslaught of severe and persistent difficulties.

The Vicious Circle in Urban Schools

Both urban and non-urban schools encounter frustrations and impediments to their work: low achievement scores, uninspired teaching, decreasing tax bases, poverty in the community, desegregation, demographic shifts, ethnicity mix, mobility and attrition among students and staff, too-large districts and schools, decay of facilities, politicization of the community, crime among youth, dropouts, truancy, drug abuse, and so on. But urban schools are burdened with more of those difficulties at any one time and in more severe degrees than are non-urban schools. Most urban schools contain larger stock-piles of troubles from which their members can extract problems than do most non-urban schools.

When troubles pile up, when the stew of difficulties becomes so constant, intrusive, and demanding that it tears out the vitals of the school's work, teachers and administrators become distraught, anxious, and bone weary. Even the constant perplexity about the difficulties that should best be chosen as problems is anxiety-provoking and wearing. Teachers' energies are drawn away from their teaching into worrying and fire-fighting. They have little energy left to put into the demanding task of reconceiving their stresses as problems about which something might be done.

Under stress and enervation, members of urban schools often turn in one of two directions. One reaction is to stop taking action and to become deeply pessimistic and cynical about the possibility of fruitful change. It is not surprising that teachers, in particular, should react that way. They have suffered from too much fruitless upheaval. Superintendents declare new policies, programs, and procedures and appoint new functionaries. Consultants come in and demand teachers' time for a myriad of projects. Teachers' associations and unions make demands for new rules they think will reduce stress on teachers, but the new rules often add other stresses. Parental groups add their demands, and so it goes. But very few of the efforts make any difference. Teachers come to look upon any new proposal as almost certain only to add to their burdens and to drain their energies without any benefit. They want desperately to be left alone. Posing a problem to be worked on becomes a threat, not an opportunity.

The other frequent response to stress and enervation is to demand miracles from outside helpers. Some urban educators still believe that a half-million-dollar project will cure their woes with little effort on their own part. Or they may hire in consultants, but mindful of consultants in the past who have drained their energies to no profit, they say to the new consultants, in effect, "Show results quickly or leave." The attitude is understandable, but unrealistic nevertheless.

Both those two reactions to stress and enervation lead to further abortive efforts. Neither a sluggish participation in a new project nor unrealistic demands upon it improves the likelihood of its success. And the projects that fail simply add to the burden of difficulties urban educators suffer. We have diagrammed the vicious circle of effects in Figure 2-1. The figure shows a cluster of positive feedback loops: a worsening of one of the conditions worsens the others. The vicious circle feeds upon itself; the difficulties mount and become harder and harder to alleviate.

This is not the place to limn all the details in their terrible colors, but we will take space for one brief example of the vicious circle. In the more stressful school districts, superintendents often have rather

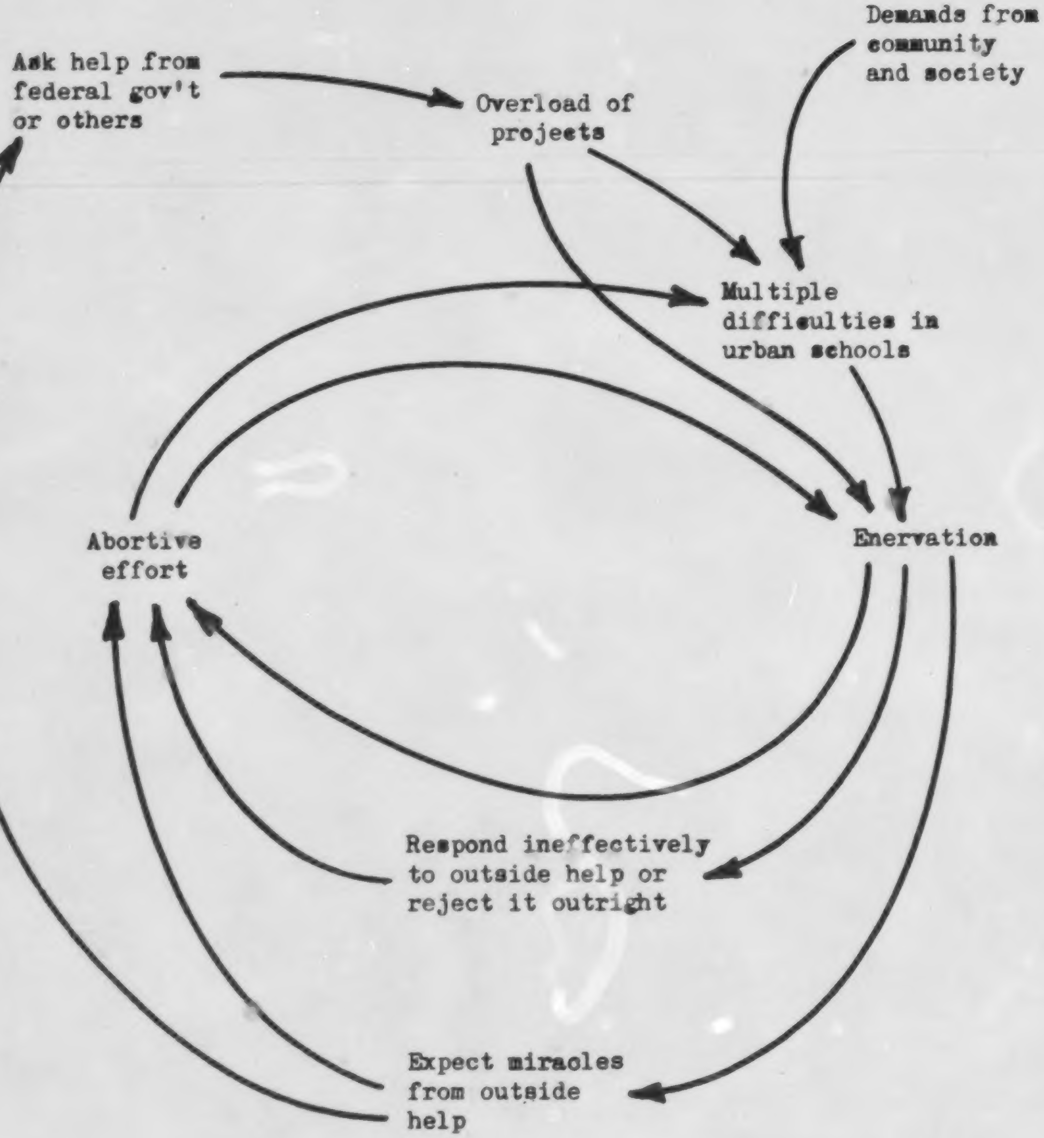
Demands from community and society
Ask help from federal gov't or others
Overload of projects
Multiple difficulties in urban schools
Abortive effort
Enervation
Respond ineffectively to outside help or reject it outright
Expect miracles from outside help

Figure 2-1. The vicious circle of mounting difficulties in urban schools and abortive efforts to alleviate them.

brief tenure. They burn out and look for easier jobs, or they make enemies during their heroic efforts to improve matters, and those enemies engineer their expulsion. (In Oakland, one superintendent's tenure was cut short by assassination.) When a superintendent goes, the school board looks for a new superintendent who can clean the Augean stables that the previous one could not. The new superintendent declares a new policy, reorganizes the district's personnel, and imposes new programs of work--typically curricular improvement programs. Many of the teachers, however, have seen all this happen before. They remember putting in a lot of hard work in the past only to find their jobs as difficult as ever. Or perhaps they remember a program that was improving matters and their dejection when a new superintendent came in, threw out the program under way, and started a new one. The teachers protect themselves against a repetition of that experience. They obey the new superintendent superficially, but spend the least energy possible. The new program is not their idea anyway, and they have little stake in its success. Many teachers, intentionally or unintentionally, sabotage the program by doing too little too late. Some teachers persuade others to join the resistance. The program fails. Some teachers who were in favor of the program decide, "You can't do anything worth while around here. There are too many old fuddy-duddies." They look for jobs elsewhere. Some who must stay in the city retreat to their classrooms and join the resistance when the next new program comes along. The superintendent leaves, and a new debilitating cycle begins.

Breaking the Vicious Circle

Luckily, schools are loosely-coupled systems.* That is, an action in one part of the school does not immediately or necessarily produce a specified action in another part. Connections are only probabilistic. Some probabilities are rather high, such as the probability that absence lists will reach the office by 9 a.m. if the principal orders them to be there by then. Other probabilities are rather low, such as the probability that teachers will observe one another's teaching and give advice for improvement if the principal suggests that it would be a good idea. Some probabilities are rather high if a time lag is allowed. For example, some time usually elapses between the decision to adopt a new curriculum and the time the first class is actually taught. The result of the loose coupling is that not all members of a school get caught in the vicious circle to the same degree or at the same time. At any one time, some members of the school may be enjoying a respite off at the edge of the main vortex of turmoil.

Adding to the dispersing effect of the loose coupling is the natural variability in the amount of threat that different individuals perceive from the vicious circle. Persons who perceive less threat will be less immobilized than persons who perceive more (we will return to this principle in Chapter 3). Some members may even perceive more opportunity than threat, finding stimulation where others find incapacitating confusion.

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*Meyer and Rowan (1975, 1976) and Weick (1976) have described loose coupling in educational organizations.

In sum, though aspects of the vicious circle may immobilize some or even most, others may remain able to act with deliberation, and still others may be aroused to new energy.

Even though the school as a whole may not be in a good condition to begin energetic problem solving, smaller efforts can begin with subsystems containing individuals who are more ready. Below is a list of some signs to look for (we will list other signs of readiness in Chapter 5):

1. Look for school participants with some time and energy who are willing to discuss their troubles and whether fruitful problems might be built from them.

2. Look for administrators, in particular, who realize that short projects will only continue to waste their energy and who are ready to plan at least a year ahead and to bear their troubles as best they can in the meantime.

3. Look for teachers who have not yet succumbed to pessimism and cynicism and who still have energy. Often they are the newer teachers.

4. Look for those who can be motivated by a vision of joint achievement, by a vision of greater control over their own work, and by the yearning for camaraderie.

5. Look for those who understand that schools are complex systems with complex dynamics and that the norms in work groups are the key to productivity and change.

6. Look for those who have faith that there must be a better method of dealing with difficulties than blundering through.

7. And look for those who know that school improvement will require extra and sustained energy, that some kinds of change will require skills they do not now have, and that some ways of doing things now disapproved must become approved if they are to shake loose from an old way and lay the basis of a new one.

The seven signs we have just listed signal opportunities within the school. They indicate places where problem solving can usually start with a fairly good chance of gaining a beachhead, even though the school as a whole may be very unready to muster all its members for a sustained and concerted attack upon a major problem. If a small project by one subsystem succeeds, it can do a good deal to counter pessimism in other parts of the school or district.

Review and Preview

Many variables affect the likelihood that a school can achieve a sustained capacity for solving its problems. Chapter 5 contains a long list. In the meantime, we have singled out certain clusters of variables for special attention. We singled them out because, when they rise or fall to extreme levels, they make achieving a capacity for solving problems very unlikely indeed, at least by ordinary methods, and because they very often do reach those extremes in urban schools. We singled them out, too, because we believe they do not usually receive enough attention from members of schools or their consultants. In this chapter, we discussed two clusters of variables of that sort. One cluster dealt with the skill of converting feelings of frustration or difficulty into statements of gaps between a present state and a more desired state. The other dealt with a system-condition: the vicious circle of enervation and abortive effort.

In Chapter 3, we will discuss two more clusters of variables that can, at extreme levels, severely hinder problem solving. These two clusters, too, like the first two, often lie at the hobbling extreme and usually receive too little attention from members of schools and their consultants. One is an over-simple or over-pessimistic conception of human nature versus an appreciation of the richly complex capabilities of every individual human. The other is an over-simple or overly constricted conception of the school as a human organization (a living system) versus an appreciation of its very great complexity and potentiality. If we want to improve the capability of a school to solve problems, we need to know what kind of "animal" we are dealing with. If our actions within the organization (or our actions upon it) do not mesh with the ways the organization and its members function, our actions will abort or do actual harm.

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HUMANS AND ORGANIZATIONS

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Chapter 3

HUMANS AND ORGANIZATIONS

A school is a living system. A living system is more complex than a non-living system, even more complex than a large computer. A system comprised of many living creatures is more complex than a single creature. A living system composed of many humans is most complex of all.

That seems obvious. Yet it turns out to be very difficult for most of us to act toward a school with full awareness of its complexity. We often find ourselves surprised by the many and complex ways that such a living system can react.

When a member of the school forgets some of the behavioral capabilities of the school, or when someone dealing with the school from outside forgets, expectations can turn out to be unrealistic. Plans can go awry, promises can become impossible to keep, schedules can become absurd, costs can skyrocket, good intentions can reap resentment, and the sincerest efforts at coordination can jam the gears.

In its essence, the point is very simple. When setting out to solve a problem or to heighten a school's ability to solve problems, if you anticipate less than the possible range of actions in the school, you are likely to find yourself surprised and your problem solving stymied. You may even find that you and the school are worse off than before. The mistake is like supposing that an airplane works like an automobile, or that a human has no capacities significantly different from those of a rat, or that an organization will behave like a single individual.

That is easy to say. In fact, most members of schools and most consultants can probably say it as well. Why do we spend a whole chapter on the point? One reason is that humans are able to talk in one way (and believe devoutly what they say) while acting in another way.* All of us--whether school people, consultants, or writers of books--are susceptible to that malady. The only safeguard against it is eternal vigilance. We hope that the complexities we describe in this chapter will serve as a checklist against which to test our vigilance.

A second reason is that familiarity breeds an illusory simplicity. When we work with a school day after day, we fall into routines that lull us into forgetting how complex the school really is. When we find people in the school behaving contrary to our expectations, we often forget that one explanation for our failed prediction is that our understanding of organizational behavior is deficient. Instead, we too often blame our error on the presumed perversity of those other people. We hope this chapter will restore the awe of those who have forgotten the true complexity of humans and schools as living systems.

The mistake of underestimating the complexity and capabilities of humans and their organizations is not made only by stupid or inexperienced people. It is also made by otherwise highly competent people and by people in high places. Some years ago, the United States Congress voted to prohibit purchases of sugar from Cuba with the expressed purpose of persuading the government of Cuba to acquiesce to more of the Congress' wishes. The reasoning seemed to be much the same as one would use in taking candy away from a child in the family--a stupefyingly over-simple conception of international relations. As history records, the technique did not work.

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*Argyris and Schön (1974) use the term "espoused theory" for the way people talk to themselves and others about the behavior of individuals and organizations. Then one infers their "theory in action" from the effects of their behavior on individuals and the organization. They describe the effects on the functioning of an organization when the two kinds of theory match or are discrepant. They also describe some of the difficulties in bringing the two into a match.

Another example of over-simple conceptions of behavior in organizations (in our national government, again) is that of the decision to invade Cuba at the Bay of Pigs. The advisers of President Kennedy included some people of unusual general ability. Yet they urged him into the fiasco at the Bay of Pigs. Janis (1972) says:

> The group that made the basic decision to approve the invasion plan included some of the most intelligent men ever to participate in the councils of government. Yet all the major assumptions supporting the plan were. . . completely wrong . . . .
>
> The President's main advisers certainly did not expect such an overwhelming military disaster. Nor did they anticipate that the United States government's attempts to disclaim responsibility for the initial air assault would be thoroughly discredited, that friendly Latin American countries would be outraged, that protest meetings would be held in the United States and throughout the world . . . , that intellectuals who had regarded the new administration with high hopes would express disaffection in sarcastic telegrams . . . , or that European allies and United Nations statesmen would join in condemnation (pp. 14-15).

It is especially important for members of a school to understand the complexities of their organization when they are trying to solve non-routine problems. The natural "wisdom of the body," so to speak, enables a school to weather most ordinary missteps in routine management. But the natural wisdom of the organization serves equilibrium, not change. Solving non-routine problems requires changes in routine. A plan for change based on wrong assumptions about the nature of the school as a living system is doomed to failure. Administrators, consultants, or others who propose change must be especially knowledgeable about the school as system.

We do not mean to say that a change agent must be able to predict every action that will occur at every step. The details of human action in an organization can never be fully predicted or controlled. Some human actions, even in the most intelligently designed change project, will occur to impede the planned steps. Part of the requisite understanding of a human system is the understanding of ways that unpredicted conflicts and impediments can--and cannot--be productively resolved.

Part of our difficulty in keeping complexity in mind is built into our occupations and roles. Persons in some positions concern themselves chiefly with providing inputs of matter, energy, or information to the organization and typically give less thought to what members of the organization can or will do with the input. Financiers, librarians, and suppliers of coal are examples. Persons in other positions concern themselves with the ways individuals exchange information or display their emotions--or decline to do so; those specialists typically give less thought to the sources of the information or to organizational conditions that nurture the emotions. Psychiatrists and consultants in group dynamics are examples.

We have nothing against specialization. The change agent on site should use specialists when they are needed. But someone on site must have a grasp of the complexities of the whole living system and protect the change program against the trained incapacities of the experts.

We will present here a list of six aspects or levels of the complexities in school organizations to serve as a sort of check-list. We will also discuss the ways that various kinds of actions intended to influence schools and their members do or do not cope with the complexities of the school organization. Our purpose is to show that neither the best of intentions nor unbounded energy is enough to bring about changes that stay changed, not to speak of developing a sustained capacity for local problem solving. A good deal of knowledge about humans and their organizations, along with the skill of being able to act on that knowledge, is necessary in most cases. We do not claim that the requisite knowledge is conferred along with the PhD; usually it is not. Nor do we claim that a string of college courses is necessary background to acquiring the requisite knowledge; they often misinform. We do claim that the requisite knowledge is rare among members of schools and fairly rare among their consultants. We are trying to outline the necessary knowledge, so far as we believe we have discovered it, in this document.

Layers

We begin our picture of the complexity of a school with a very quick sketch of the layers at which different kinds of complexity occur.

Openness to Environment

A school is an open system. So is an automobile. Both exist through their interdependence with their environments. Both take things from the environment and give things to it. An automobile deals mostly with physical matter (gasoline, water, exhaust gases, and the like), though it also gets information about what to do with those things through the steering wheel, the accelerator pedal, and other devices that communicate with its environment. Schools deal with matter, energy, and information. Except at budget time, the transmission and transformation of information captures most of the attention of most people inside and outside schools.

At one time or another, frequently or infrequently, a school alters what goes on inside it to cope with what is coming to it from outside. It must adapt to changes in monetary support, to complaints from parents, to changes in numbers of incoming students, to changes in the job market for its graduates, to state and federal legislation, to court decisions, to the weather, and so on. A school sometimes changes its interior operations with the intention of altering what it puts out into the environment, in the hope of changing the input it is getting from the environment. As we write, for example, many schools are trying to increase the mean scores of their students on achievement tests in the hope of getting less adverse criticism from parents, legislators, and others.

An automobile never tries to alter its environment. Both automobiles and schools are open systems, but schools are much more than that. In addition to being able to exchange matter, energy, and information with their environments, schools have several other very important capacities that we will describe immediately below. Each additional layer of capacity adds a layer of complexity with which people working in or with schools must deal. We will return later to the mischief that can be wreaked by misconceptions or forgetfulness about these capacities and complexities.

Images

Bees, cats, and humans have an ability that automobiles, bacteria, and trees do not. Humans and other animals carry images in their brains of themselves and the world about them. Their interaction with the environment, therefore, is not as direct or immediate as that of simpler systems. Humans can, it is true, react directly to sensory input by reflex--as in the case of the startled response to a loud noise or anxiety at hearing a taboo word. But the more frequent, typical, and important part of human behavior responds to images of self and world, not directly to reality.*

By "image," we mean to include rational, conscious conceptions of the outside world and one's relation to it, but also all the unconscious mappings in the nervous system. We mean all the interior representations that have been called cognitive maps, gestalts, models, personal constructs, frames of reference, perceptions, habits, attitudes, perspectives, conceptions, theories--in brief, any and all of the kinds of interior representations through which a creature interprets the impingement of the environment.

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* The study of the way the behavior of humans and other animals depends on the brain's mapping of self and other is reported in a vast literature, too vast to be decently represented by a few citations here. The empirical pioneers were the gestaltists, the phenomenologists, and the ethologists, not to mention the speculations and insights of earlier philosophers. The more recent additions to the literature profit from a greatly expanded understanding of the evolution of the human brain and its neurology.

One bee "tells" others where flowers can be found, and the others fly very directly there. If a domestic cat cannot get in one door of the house, it goes very directly to another. But the cognitive map of the bee and even the cat are very primitive compared to the elaborate images of the human. We emphasize two points: First, humans interpret experience, including communicative experience, through already existing images. Second, every human holds images that are very elaborate and that are unique.

Every human's image of any reality is unique. That is one of the reasons that putting a book, a thousand dollars, or a child into the hands of one person has a different result from putting it into the hands of another. Every school is a unique collection of individuals. That is one of the reaons that putting a book, a thousand dollars, or a child into one school can have a different result from putting it into another.* And that is one of the reasons it is very chancy to impress any program on a school without diagnosing the conditions in that school and adapting the program to them--whether the program be one of curriculum, parental involvement, human relations, budgeting, or anything else.

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* We say this despite several large-scale studies showing that schools do not differ much in their effects on the academic achievement of children, once the advantages of family are taken into account. For one thing, there are always a few schools that deviate from the average. For another, a large-scale study of the different effects of schools on emotions, values, and readiness to take initiative has yet to be done. Finally, even if it is true that the great majority of schools do not now differ much in their effects on intellectual regurgitation by students, it is possible that they may differ more in the future. DeCharms (1976), for example, has shown how new norms for interaction between student and teacher can bring about not only improvements in academic achievement, but also greater self-confidence, internal goal-setting, personal responsibility, and internal control of behavior on the part of students.

Images of Images

Humans share with other animals the fact that they deal with the world not directly, but through their images (conceptions) of it. But humans have still another capacity, a capacity that makes them fully human. In greater elaboration than any other animal, humans can describe their images of the world in the symbols of language. That is, they can make images of their images. The fact that humans can compare images of present states with images of possible future states enables them to conceive problems, solutions, and steps toward solutions. The fact that they can talk with one another about their present and imagined states enables them to benefit from the resources of one another in systematic problem solving.

The ability to conceive and talk about their own images gives humans an immense power over their own future. It also enables them to begin grand projects only to find that they have built another tower of Babel. We will return later to possible disappointments.

Two Persons

In the sub-sections above, we have spoken mostly about single individuals as living systems. We have pointed to the complexities of

(1) interdependence with the environment, (2) acting in reference to an image or cognitive map rather than directly in response to sensation, and (3) acting in reference to images of images. Schools are complex because they contain the very complex living systems we call humans. But they are all the more complex because they contain many humans in interaction.

Humans are social creatures. As clearly a mark of humanness as elaborate language is the very great elaboration of social relationships among humans. Those relationships are maintained, threatened, and revised through communication. Schools are established, maintained, operated, and altered through communication.

Communication goes from image to image, never directly from person to person. And the fact that humans have the capacity to form images of their images means that their talking about their images can become immensely complex. When one human is talking to another about some possibility of action in their common world, it frequently happens that both get confused. They get confused about whether they are talking about what one is doing, what the other is doing, what both are doing, what one might do, what the other might do, what both might do, what someone else might do. They get confused about whether they are talking about action or about talking, about possibilities or commitments, and so on. Those confusions are made possible, of course, by the marvelous ability of humans to make images of their images. The human capacity to draw maps of the future and to talk with one another about those maps makes coordinated planning possible. It also makes the task very complex and full of pitfalls.

Groups

When persons act as participants in groups, they form conceptions of the groups and of parts of them. For example, a teacher may have images not only of other individuals in the school, but also conceptions of friendships among pairs, factions within the faculty, cliques among the students, the faculty as a whole, the student body as a whole, and the school as a whole. When the actual persons in those groupings come together to act jointly, every individual brings to the meeting a unique conception of the individuals and groupings he or she is dealing with. Thus complexity is compounded.

Schools are composed of subsystems. Various groups of persons get together to carry out some part of the school's several functions. As we said earlier, each person brings to the task a unique conception of the task, of the groups engaged in the task, and of the individuals involved. And though the individual conceptions are often mismatches, the school must somehow operate despite the mismatches. Images of the school, its parts, and its functions must somehow be brought close enough together to enable coordinated action to occur.

School

Further complication arises when a school is too large for all its members to gather face to face to work out their problems. Work must then be done in subsystems small enough so that each member can participate with sufficient frequency in the communication net. Coordination between subsystems then falls upon representatives. The necessity for subsystems, a necessity arising in all schools except the very smallest, multiplies the complexity. If the representatives are to represent their groups accurately, they must achieve accurate images of the images held by their group's members. Representatives become vital and delicate links. Achieving adequate coordination of effort, both within face-to-face groups and through the representatives of those groups, is the task of administrators and their advisors.

When changes are contemplated in the school's functioning, images of the future demand to be brought close enough together to make possible steps toward a common future. In both stability and change, effective problem solving must at some stage enable the disparate images to be understood through a commonly held image of those images.

We have now briefly described six layers of complexity in the school: (1) the interdependence of the school with its environment, (2) the action of each person in reference to the person's own unique image of reality rather than to direct sensory input, (3) each person's construction (in language) of images of images, (4) the possibilities of match and mismatch of images when two persons communicate, (5) the multiple images of multiple relationships among members of group or school that persons construct, and (6) the necessity for subsystems and representatives in all but the smallest schools.* Each of those features of a school adds its own kind of complexity. Each, too, brings with it its own variety of snares in which school members and their consultants can get caught up.

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* We borrowed the first four of these layers from Boulding (1956) and Pondy (1976).

As we have described layers of complexity, we have compared schools with simpler living and non-living systems: with single humans, with cats, bees, automobiles, and the like. We have done that deliberately to dramatize the flabbergasting complexity of a living system such as a school. Trained mechanics sometimes fail to keep an automobile running. Bees sometimes sting experienced keepers. Cats often foil efforts to train them. Even a lone, inexperienced child can embrangle the influence attempts of adults. We should not be surprised that school administrators and consultants meet frequent frustration. We should not be surprised that a program of change can require months or years and constant shepherding.

The next two sections describe opportunities and pitfalls attending each layer of complexity. We begin with the layer we last described: the complexity brought about by subsystems interacting through representatives.

The School: Subsystems and Representatives

Subsystems

A system does not operate as an amorphous mass. Its interior operation is organized through subsystems. When we speak of subsystem, we mean a collection of persons (along with the materials and tools they use) that is distinguishable by having one or more specific tasks (functions) to perform and by the fact that its members engage in more communication with one another about those tasks than with persons outside the subsystem.* A subsystem is usually visible as an individual or a group. An administrative cabinet is an example or a readily visible system. It is visible when it meets--when all its members sit together. It has specific tasks to perform, and its members talk about those tasks with one another more than they do with others. But subsystems do not always gather face to face; some do so rarely. The string of persons who forward requisitions and return supplies, for example, is usually visible only in fragments.

The labels system, subsystem, and environment are not to be applied once and for all to particular collections of people. An individual is a system in herself or himself, but in an organization every individual is also a subsystem in a larger system or subsystem. The principal is an example of an individual who is a crucially important subsystem in most schools. A particular group can be simultaneously a system in itself, an environment for an individual in it, and a subsystem in the school. Whether you call a particular group or organization a subsystem, system, or environment depends solely on the part of the whole scheme of things to which you wish to give chief attention. In this document, we usually think of the school as the "system."

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* Different writers use the term system and its prefixed form subsystem in different ways. We are not using either term to mean a systematic way of doing something, as in "a system for routing application forms." J. G. Miller (1978, pp. 16-22) distinguishes three kinds of system: conceptual (a system of symbols, such as an arithmetic system), abstracted (such as a descriptive model of a concrete system), and concrete (a tangible collection of tangible things, such as people and books, organized into interacting interrelated subsystems or components). We use the terms system and subsystem in Miller's third sense. Since we are dealing with the living system of the school, our concrete system always requires humans as its key moving components.

Different writers choose different ways of classifying necessary functions in human organizations. Miller (1978, p. 3), for example, assigns functions such as these to subsystem: distributor, matter-energy storage, input transducer, channel and net, memory, and decider. Katz and Kahn (1966, pp. 39-47), to choose another example, assign these functions: adaptive, informational, maintenance, managerial, production, and supportive. We do not insist on any particular classification of function.

Some subsystems in a school are formally established; members are given titles (Principal, Chair of the Curriculum Committee, etc.), special rooms are allotted for their use (Mrs. Nordstrom's room, Counseling Offices, etc.), they are listed in official documents (List of Standing Committees, etc.), and so on. Others spring up as need may require. Some of the informal groupings are above board, some are clandestine.

Formal structure is built to enable the functions of the school to be carried out, but no formal structure can anticipate all the human actions that will occur in an organization. Humans are too variable. No school can operate only through its formal structure. Hanson (1978) describes the interplay of formal and informal subsystems dramatically. After observing several schools in a large midwestern city, he wrote (using the term subcoalition where we would use the term subsystem):

> Some very specific organizational patterns were immediately visible, such as buses coming and going, bells ringing on the hour, football players turning out for practice, lunches being served, meetings being called, role being taken, and examinations being given. Other patterns took weeks to sort out, such as the struggle by teachers to gain extensive participation in the selection of new administrators, the drive to improve the testing program, or the struggle to obtain greater support and resources for specific academic programs.

> In short, . . . we found a mixed bag of structured and unstructured activity, formal and informal procedures, and controlled and autonomous behavior (p. 9).
>
> As depicted thus far, a school is made up of differing decisional environments that form the bases of spheres of influence. However, even within their own domains, the teachers or administrators in the Sherwood Schools typically were not observed as acting in concert. Instead, they could be seen acting in small groups (sometimes merging into larger groups) which would struggle to achieve some objective (e.g., "We must improve our relations with parents," or "We need more bilingual teachers.").
>
> These subcoalitions seem to share with one another only those ambiguous goals which act as public flags with great symbolic value. Goals such as "to develop an awareness of the values inherent in our democratic society and loyalty to its underlying principles" serve as symbolic cement which holds the organization together. In an informal sense, however, the researchers observed the subcoalition members establishing their own priorities based on their own interpretation of dominant needs (e.g., client, community, teacher, school, etc.). In any given school the researchers might observe, for example, one group of teachers trying to change the reading program, a second concerned with improving working conditions, and a third trying to block changes in the testing program.
>
> At the elementary and secondary school levels, the researchers found formal and informal subcoalitions which were organized around long-standing "durable interests" ("We are always looking for ways to build strong community relations") or episodic "troublesome issues" ("It hit the fan last week regarding a reading assignment"). We found the subcoalitions generally had focus, task direction, an identifiable membership (although some members were rather fluid in participation), a rough but generally understood set of norms and expectations, a sense of legitimacy, sources of power, and a set of constraints limiting the arena of action (pp. 17-19).

Hanson's specification of task direction and identifiable membership correspond to the two necessary characteristics of a subsystem that we gave earlier. When a subsystem becomes active and strong, it takes on the other characteristics listed by Hanson. Hanson continues:

> At the elementary level, . . . we typically found three types of formally organized subcoalitions: *the lower grade teachers*, who were concerned primarily with the formation of of student-role norms and social values; *the upper grade teachers*, who were primarily concerned with the formation of basic skills; and *the standing committees*, such as the guidance committee and the student activities committee.
>
> In the Sherwood Schools, informal subcoalitions could be seen forming around . . . contradictory points of view. Unlike the formal subcoalitions, the informal systems had an ebb-and-flow quality about them. For a time an informal subcoalition would be highly visible, influential, and active; and then drop from sight only to return again at a later date. Informal subcoalitions seemed to emerge where formal subcoalitions were unwilling, unprepared, unstructured, or unauthorized to serve as the advocate or problem solving vehicle for a troublesome issue (p. 19).
>
> The data of our research suggest that in schools where the subcoalitions are not integrated in any meaningful way, but tend to work against one another, the schools make minimal progress toward resolving their special problems. In one of the secondary schools, for example, two strong pedagogical alliances emerged among teachers to different pedagogical persuasions regarding a school policy permitting unstructured student time. The two subcoalitions clashed over the policy for such a period of time that a meaningful test of the concept was never carried out.
>
> It is important to note that the leadership roles of the principals typically played important parts in the levels of differentiation and integration of subcoalitions achieved in schools. The researchers concluded that those school administrators who were most knowledgeable about the informal coalitions and could work through them instead of against them tended to have the most success in implementing the new academic programs. In short, these administrators were able to build a large coalition out of several smaller subcoalitions (pp. 23-25).

People in schools (as in any organization) do not very often act separately, in isolation. They gather together to increase their available resources and to gain strength from mutual encouragement, like-mindedness, common desires, and the political power of group action. When the formal structure does not provide a ready-made grouping, people will form their own groupings, as Hanson makes clear. As Hanson also mentioned, problem solving in schools succeeds through the effective use of subsystems, not through separate individuals. A change project can succeed only if the relevant existing subsystems are brought into the project and if needed new subsystems are built. Training in building new subsystems and refurbishing old ones is often necessary.

People differ a great deal in their skill at forming effective subsystems. Schools differ a great deal in the extent to which their norms encourage or discourage the formation of new subsystems. So to speak, schools have different degrees of skills in nurturing temporary subsystems or new permanent ones. Students typically have less skill in forming effective subsystems than do teachers. We will return to the necessity of building strong subsystems in Chapter 5.

Interfacing

The work of subsystems must be coordinated. That would be relatively easy if only formal, readily visible subsystems existed. We have seen that informal subsystems spring up, fade out, and are supplanted by yet new informal subsystems. It is often very difficult for administrators, change agents, and others to keep track of all the relevant groupings that exist in a large school. Coordinating subsystems would be easy, too, if their members passively awaited instructions and initiatives from the school's administrators. Humans do not behave that way.

Even when they say, "We were waiting for you to tell us what to do," they actively make that choice from among the alternatives. The coordination of the work of subsystems is one of the crucial and very complex tasks in any human organization. It becomes even more delicate during periods of change.

Coordination between subsystems commonly takes the form of negotiation. Because of the complexity of schools and the multiple tasks they carry on, almost everyone participates in cross-group negotiations at one time or another. Hanson (1978) says:

> The negotiations in schools are informal rather than formal and virtually everyone participates when their interests are involved. When a troublesome situation arises for an individual or group, they seek to spin a network of negotiation around it. Teachers negotiated with administrators for a different approach to handling tough discipline cases, administrators negotiated with teachers for more parent contact, students negotiated with teachers for less homework, . . . and so on.
>
> The agreements made in the contested zone were usually temporary and fragile, subject to renegotiation the next time the same issue surfaced. Because of the constant flow of small and large tasks that emerged in the contested zone, the teachers and administrators were constantly shifting their energies and efforts to new problems and negotiations that enabled them to get through each day. The end product of the ongoing negotiation process was . . . an acceptable degree of order and stability [in] a zone of potential disruption and discord (pp. 25-26).

Negotiations among subsystems are not usually carried on by bringing all members of the two or several groupings together face to face, because the total number of people is too large, because all members cannot be freed from other duties at the same time, or for other reasons. Most interaction between subsystems, therefore, takes place through some kind of interface. Sometimes the interface consists merely of message-carriers not empowered to carry on negotiations. Most interfacing, however, is done by representatives--persons or small groups empowered to one degree or another to make agreements and commitments in the name of their subsystem-constituencies.

Representatives meeting as a group differ in an important way from an ordinary task-oriented subsystem. It is one thing to work in a subsystem that is a tightly knit small task group and another to work with an interface comprising individuals who represent other groups. For example, five teachers in a teaching team planning a week of lessons call for a very different kind of work from five team leaders meeting to coordinate the work of their five teams; the latter is work across subsystems--work in an interface. Though the coordinating group of team leaders may itself, of course, acquire the character of a subsystem, their task is special. It is primarily that of "interfacing"--communicating and coordinating--among teams. It takes a special skill.

Interfaces are complicated by the ways that the interfacing subsystems function. One of the well-known principles of consultation is that an interface does not function well unless each interfacing subsystem "has its act together." For example, one elementary-school building where we have worked houses a traditional school and a separate alternative school. Because the two schools share some space and certain services (lunch-room, gymnasium, library), a liaison committee exists to resolve conflicts in their use. Members of the alternative school faculty are highly cohesive and feel very trusting toward one another. They empower their representatives to the liaison committee to act on their behalf, abiding by the decisions their representatives make. The faculty of the traditional school, in contrast, contains schisms and cliques; its members do not as a body empower their representatives on the liaison committee so that a decision can be made. The representatives from the alternative school are frustrated; they feel that the others have not done their communicative homework and do not come prepared to do real work. The representatives from the traditional school are frustrated; they feel that the others are too pushy and probably do not give the rest of their faculty a full voice in the decisions.

When a school alters its structure and role-relationships away from the hierarchical and moves toward the more collaborative, the interfacing becomes more complex for two reasons. First, the sheer number of interfaces increases. Second, most people are not skilled in non-hierarchical modes of coordination. New complexities of interfacing arise.

During the transition period when a new structure is being built and new roles fitted in, a hierarchical structure cannot effectively be used, since forming the new structure, practicing the new role behavior, and becoming committed to the new mode is a learning process, not a process of carrying out routines under supervision. The new learning occurs both within individuals and among individuals. The social part of the learning requires a great deal of coordination so that as norms change, everyone (or almost everyone) is aware of the places along the paths of change that others have reached. That coordination requires a great deal more communication than ordinary.

When two groups interface, the link can take several forms. (1) A person or subgroup from one group can be the communicator between the groups. (2) A person or group that belongs to neither group can be the communicator or mediator. (3) Persons or subgroups from both of the groups can join together to perform the interfacing. A familiar example of the last is the conference committee between House and Senate. Interfaces comprised of multiple persons are safer than those comprised of a single individual. In a multiple-person interface, one person can fail to transmit a message or transmit it wrongly and the correct message can still be carried by the other persons. The added safety is bought, of course, at the cost of using more person-hours in the interface.

Parents and Students

Communicating with parents or students is especially difficult, because effective interfaces between those groups and school staff are typically lacking. An interface cannot be effective unless both interfacing systems (or subsystems) function effectively within themselves--that is, unless each system (or subsystem) can transmit the relevant information from the right parts at the right time to the interface and get back the relevant information to the right parts at the right time. Typically, neither parents nor students are organized that well. If a change project is to include students or parents, the first task is to reach them and organize them--at least to some minimal extent.

The fact is, of course, that many administrators and teachers are reluctant to deal with a strong, effective group of parents or students; they fear loss of power. Some faculty members are conscious of their wish to keep parents and students powerless and some are not. An early task of a change agent who seeks to help school people communicate more effectively with parents or students is to carry on careful diagnosis to find out how many of the school staff indeed want more mutual communication and influence to ensue.*

Recapitulation

A sustained capacity for solving problems in a school requires effective articulation among its subsystems. That, in turn, requires that all persons concerned be aware of the subsystems that exist, their functions, and their membership. It requires that effective interfaces exist--that people serving as representatives have the necessary skill. It requires that the subsystems function well within themselves. Satisfying all those requirements is not easy.

The coordination of subsystems in the school is complicated by the fact that informal and temporary subsystems spring up spontaneously. In a school that encourages its members to initiate temporary subsystems, the temporary groups can be coordinated with others, difficult though it may be to keep tracks of what is happening in all the rings of the circus. In a school that suppresses its informal organization, however, the informal and temporary subsystems will spring up anyway, but clandestinely. They are then almost impossible to coordinate with the formal subsystems. What usually happens in that case is that the functions being carried on in the clandestine grouping are hidden until they burst forth into the open in a combative mode. That mode bodes ill for a sustained problem-solving skill in the school as a whole.

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* School people are not unique in wanting groups in the environment to remain low in the influence they can bring upon the school. The same phenomenon occurs in every organization in our society that provides a power base for its managers. The technique of divide and conquer is pervasive among power elites. Bowles and Gintis (1976) have described how the schools mirror U.S. society in that regard.

A sustained capacity for solving problems in a school requires the ready participation of subsystems in the actual steps of solving problems. That requires that the subsystems themselves be strong and effective. Building strong and effective subsystems is not always easy to do, especially in the turmoil that characterizes so many urban schools--the condition we described in Chapter 2.

Administrators, other members of schools, and even professional change agents sometimes put changes into motion without paying attention to the subsystems of the school, formal or informal. That is, they sometimes communicate only with individuals or with arbitrary collections of individuals, not with groups comprising subsystems as wholes. That is a serious mistake. If some members of a subsystem are left out of the work of solving problems and moving into the changed role-relationships the solution may require, the enterprise will be crippled. To bring lasting change, subsystems to carry out needed functions must act effectively. Often, old subsystems must be strengthened, new subsystems built, or both. In the next section, we describe some of the complexities in building strong subsystems.

Groups: Norms and Mutual Helpfulness

The face-to-face group is the archetype, the womb, and the prognostic of the organization. The problem-solving capability of the school as a whole can grow only as the capability of its subsystems grows. And in most cases, putting the members of a subsystem face to face permits them to show their best coordination in solving problems.

The face-to-face group tests the degree to which trust, collaboration, diagnosis of the present state, reaching out for resources both from within the group and from outside it, joint commitment to a proposed action, and coordinated action are possible in the school. If groups in the school exhibit those capabilities only weakly or sporadically, then the problem-solving capacity of the school will be weak and sporadic; the school will fail at any change project that requires strong changes in roles. If a school is to develop a strong capability for solving problems, the functioning of face-to-face groups must usually be strengthened. If at least one group can develop the capabilities we just mentioned to a strong degree, that will be evidence that there is nothing in the character of the school as a whole that is preventing groups from changing. The first group can become a catalyst for the development of later groups. We say more about that sequence in Chapter 5.

The group tests the capabilities of the school because it is the smallest unit in which the rudiments of organizational skill can be seen. Communication between two people is not a simple matter; indeed, communication one to one could be considerably improved almost everywhere in our society. But effective coordination in a group of several people, though it rests on effective communication in pairs, requires still further skill. The further skills groups require beyond those a pair of communicating persons can exhibit can be clustered into two sorts: (1) third-party helping and (2) role-taking (though the first is really a sub-category of the second).

Third-Party Helping

When two people communicate, it is easy for one or both to overlook parts of what happens. Person A may propose a course of action and at the same time warn that certain precautions should be taken. Person B may be so frightened by the proposed course of action that he "forgets" to ask person A to state the precautions she had in mind. Indeed, if person B feels a very severe threat, he may become neurologically incapable of speech for a few moments; Hart (1975, pp. 126-131, 140-141) has explained the mechanism. Or at something person C says, person D may frown and squirm in his chair, but in the heat of discussion C may fail to ask D what he wanted to say during the frowning and squirming.

It is easy, too, to suppose more is happening than really is happening--to "read into" a remark or action more than is there. Person A may say that the third-grade room doesn't have enough sandbox materials, and person B may say that there aren't occasions in the third-graders' schedule for them to experience much love. Person A may leap to the conclusion that B thinks there are enough sandbox materials, though B may very well agree with A on that point. Or person C may leave the room just as D begins to speak, and C may conclude that D doesn't want to hear what she has to say. But D may merely have been able to delay no longer going to the toilet.

In a group, it is unlikely that everyone will miss the same thing at the same time or over-interpret the same remark at the same time. Those who notice what is going on can help those who don't. A great deal of going over the same ground to clear up confusions and resentments can be avoided if members of the group help pairs to clarify what they have said or what they have heard. Every member of the group can act as a "third-party helper" to every pair in the group and to the group as a whole. In brief, members of an effective group take it upon themselves to maintain the effectiveness of the group's functioning. Obviously, if members of a group spend a lot of time missing important parts of what people are saying (or signalling non-verbally), and if they frequently jump to conclusions about what others mean and are wrong about it, and if those errors go uncorrected, the group is going to solve very few problems. We have observed many groups, in both urban and non-urban schools, "getting nowhere" because of just such errors. We forego here a discussion of the details of becoming an effective group member; interested readers can consult Schmuck, Runkel, Arends, and Arends (1977, Chapters 1 and 3 through 8) or any other book on effective group process.

Norms and Role-Taking

Obviously, if members of a group are to act as "third-party helpers," that service must be welcomed by the others. The helpers must be rewarded (if only with thanks), not punished. In brief, there must be a norm in the group that approves that kind of helping and disapproves withholding it. (Unfortunately, we have seen many groups in urban schools in which the norm is the opposite.) New norms that facilitate effective problem-solving procedures must start in the subsystem-groups. They cannot be mandated at the level of the school as a whole. They must be tried, modified to forms acceptable to local custom, revised, and tried again in the face-to-face group where everyone can find his or her own way, delicately, into the new way of doing things--where each can be sure, by watching others and hearing them directly, that her or his new sallies are being accepted. The principle applies not only to third-party helpers, of course, but to any new procedure.

A role exists when a norm (or set of norms) specifies how a person in a particular position should behave. If a norm encourages third-party helping in group deliberations, then that behavior becomes part of the role of the group member. Effective problem solving requires several other kinds of roles not common in today's urban schools. The role of the chairperson, for example, needs new kinds of norms to guide collaborative problem solving. Other uncommon roles (with supporting norms) are needed for other important functions necessary in the effective problem-oriented group: for clarifying communication, establishing goals, uncovering and working with conflicts, improving group procedures in meetings, following systematic steps in solving problems, making decisions, and assessing progress (for detail on those functions, see Chapters 3 through 8 of Schmuck, Runkel, Arends, and Arends, 1977).

Effective work in groups requires constant checking to ascertain whether the image each person has of the images others have of the work being done is close enough to the image others have of "what are we doing here?" so that coordination and thence productivity can occur. (That sentence may seem complicated, but it is far less complicated than the actual communication process that goes on in work groups.) Skill in the interpersonal functions we have mentioned in this section can assure that the necessary checking occurs.*

Administrators, other members of schools, and even professional organizational consultants sometimes put changes into motion without checking whether the functioning within groups is sufficiently strong to maintain the risky steps of change and the new norms that stability after change will require. That is a serious mistake. Existing norms usually work to maintain the existing pattern of stability, and usually new norms must be learned if new role-taking is to occur. Training in new group skills and establishing new norms to support the use of the new skills is almost always necessary in a change project of any scope.

Effective work in groups also rests upon the skill of effective communication one to one. We go next to that layer of complexity.

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*For more on skill in interpersonal communication, see, for example, Arends, Burr and Schmuck (1976), Harrison (1965, 1972), Johnson (1970, 1972), Johnson and Johnson (1972, 1975), Pfeiffer and Jones (1969, 1972), Schmuck, Runkel, Arends and Arends (1977, esp. Chapter 3), and Schwartz, Steefel, and Schmuck (1976).

Two Persons:

Interpersonal Relations of the Social Animal

Humans maintain themselves, both individually and as a species, through their social relations. They maintain their social relations through communication in many forms. Communication can use words, either oral or written. It can use other isomorphic symbols such as those used in mathematics, in engineering drawings, in chess, and so on. It can use diffuse, apperceptive symbols and gestures such as those used in art, ritual, and the emotional signals of the body. It can use direct contact and coercion such as tugging, kissing, pushing, and destructive physical aggression. People in urban schools use all those methods at one time or another, even the last.

We have already said a good deal about relations between persons, and we will say more in subsequent sections while discussing other topics. We do not want to be repetitive here. But why do individuals go on communicating with one another? We hear one person say, "I won't talk to him any longer!" and another say, "I want to go talk to her about this." Why the withdrawal of one and the eagerness of the other?

Because continued communication is vital in schools, it is vital for people in schools to know how to encourage it and how to avoid discouraging it. Communication continues when it satisfies human motives. We take space here to describe three sources of satisfaction in social life that are intimately interwoven with interpersonal relations.

Social Satisfactions

A good deal of frustration in human life is inevitable, in schools as elsewhere. We believe, however, that it is possible for schools to satisfy the common human motives more fully and more often than is now the case. More than that, we believe that the level of motive satisfaction in most urban schools nowadays is too low to support a lively capacity for dealing with the difficulties typical of urban schools.

We will not review all the classifications of motives that psychologists and others have produced. We adopt the classification that originated with David McClelland (1958): that of achievement, power, and affiliation. The classification has received a great deal of support from empirical studies. In 1961, Foa noted "convergences in the analysis of interpersonal behavior," especially on the motives of power and affiliation. Since then, evidence has accumulated. The following comprise only a sample and include no studies from the laboratory but only observations in natural settings: Argyris (1973), Arnoff and Litwin (1971), Bowles and Gintis (1976), DeCharms (1976), Deci (1972), Favors (1971), Foa and Foa (1974), Glaser and Taylor (1973), Golembiewski (1966), Hage and Aiken (1967), Hickson (1966), Jackson (1968), Johnson and Johnson (1975), Korman (1971), Lammers (1967), Longabough (1966), Mechanic (1962), Silberman (1970), Whitmore (1973), Willower (1963, 1970), and Willower and Jones (1963), not to speak of McClelland's own later work, such as McClelland and Winter (1969). Some useful theorizing has also appeared; for example: Berlew (1974), Hickson, Hinings, Lee, Schneck, and Pennongs (1971) and Shields (1973).

The foregoing authors do not always use McClelland's terms, but we believe they deal with his concepts. Abstracts or annotations of the writings appear in the bibliography by Runkel and Burr (1977).

McClelland's categories, especially those of power and affiliation, receive support from recent work in the neurology and evolution of the brain (see for example MacLean, 1973; Smith, 1970; Hart, 1975; Sagan, 1977; Wittrock and others, 1977; and Chall, Mirsky, and others, 1978). About affiliation, Hart (1975, pp. 129-130) says:

> . . . as man is a social animal, descended from social animals, there is likely a deep-seated fear throughout life of not being part of a group, not being "in" and thus protected and accepted. This involves status, pecking order, and group role.

Hart discusses the concept of power to choose action within one's immediate domain of work or play (which is what McClelland means by the term) by contrasting that power with confinement:

> From far back in our history comes the idea of freedom to move as offering escape and possible survival, and of lack of running room as signifying early doom . . . . Should you be locked in the comfortable, familiar room where you may be reading a book, you would probably find yourself merely by that knowledge distressed and unable to concentrate. We regard confinement in itself as being punishment; consider stocks or pillory; prison; in school, "detention"; with small children, "stand in the corner" (p. 130).

Hart (1975, p. 210) suggests that the ability to achieve success in new tasks--to satisfy the achievement motive--is bound up with the social motive of affiliation:

> The converse [of freedom from threat] is perhaps the greatest single factor in successful learning: the building of confidence in the learner. . . . The importance of confidence,

> self-esteem, has come forward again and again, in a great variety of experimental approaches . . . . Confidence seems to rest not simply in a belief that the learner can cope, but more fundamentally in trust, resulting from experience, that one or more failures will not result in being demeaned, losing love or regard, or at least to a degree being thrust out of the group--a fear that goes far back in man's social history.

The satisfaction of McClelland's "needs" or "motives" seems demanded by our very nature. Details for achieving those satisfactions are learned, of course, but the inevitability of the continual search for their satisfaction lies in our mammalian heritage. The satisfaction of the affiliation motive arises from our social nature, and the constant adjustment of our relations to others had strong effects on our emotional state and our choices between immediate action and deliberation. The satisfaction of the power motive may arise from the need for free space of movement.

The achievement motive seems to arise from the interplay among (1) the constant influx of information through the senses to the brain, (2) the constant matching of images in which the brain is always engaged, and (3) the fact that we can move our bodies. When we move or manipulate objects around us (including black marks on paper, as we do at this writing), we can bring into match the image of the world we get through our senses and the image we have in our brains. We can "achieve" the world of our dreams -- at least sometimes.

Hart and others point out that the brain is always active. Inactivity brings a state experienced as unpleasant -- boredom. If one attempts to quiet the brain by reducing sensory input to near zero, the brain goes right on producing images anyway. Without sensory input against which to match them, the images take on the quality of hallucinations. The unrelenting activity of the brain is the neurological counterpart, of course, of the visible activity we call curiosity and exploratory behavior. That feature of the brain connects McClelland's three motives with the factor of "activity" always found by Osgood and Suci (1955) and their followers -- who have been too numerous even to begin listing here. It also provides underpinning for writings on exploratory behavior by social scientists such as Argyris and Schön (1974), Coleman (1968, 1971), G. A. Kelly (1955), and March (1972), not to speak of laboratory-oriented psychologists such as Dember (1960). The ethologist Morris (1969, p. 184) gives a picture of humankind that could have been written about urban schools specifically:

> . . . they never stop exploring and investigating. Anything and everything is examined in case it may add yet another string to the bow of survival. They cannot afford to relax for very long, and evolution has made sure that they do not. They have evolved nervous systems that abhor inactivity, that keep them constantly on the go. Of all species, it is man himself who is the supreme opportunist. Like the others, he is intensely exploratory.

People are always actively surveying their world and estimating the opportunities and dangers in it; that means that neither faculty and students are waiting passively for an administrator or other change agent to push them into motion. An initiative or pressure to change the pattern of behavior in the school is scanned, radar-like, by each individual and judged for its fit with the individual's present images of opportunities and dangers. No one ever judges a proposed problem, or a proposed solution, or any other new thing in the environment "on its own merits." The person judges the new thing on how it seems to alter present opportunities and dangers.

Satisfactions at School

We sometimes hear people say that we should not expect to get social satisfactions (particularly of the affiliation motive) at our jobs--that we should expect only to do our work and get our social gratifications at home. That advice seems neurologically impossible to take. Our busy brains will be telling us about our satisfactions and dissatisfactions in our relations with other humans whether we wish for it to do so or not.

We take the view, then, that if persons are debilitated by constant frustration of their natural needs, they cannot function well as organizational members. Happy individuals will not necessarily comprise a productive school, but unhappy individuals cannot commit themselves energetically to common work. They certainly cannot be counted on to carry forward the delicate and demanding work of organizational problem solving.

But the satisfactions of achievement, power, and affiliation cannot be obtained directly. Satisfactions come as side-effects of goals achieved, control over one's destiny secured, and mutual trust and respect enjoyed. They are not to be attained by striving for them in themselves. The occasion is more pathetic than inspirational when an administrat[illegible] exhorts [illegible] minions: "Be proud of your work! Take charge of your destiny! [illegible] be one big happy family!"

[illegible]ieve that motives can be expressed and satisfied in work. But some people do experience inertia, failure, alienation, and powerlessness in their work. Is there any hope for them? We think those people can learn to satisfy their needs if they can learn to do so in the company of others in their work group. Learning of that sort can occur if people can be helped to take small steps toward new ways of working together. No one achieves great things at work without trying to achieve little successes and finding rewards that encourage greater risk taking.

Satisfactions in schools cannot be improved merely by oiling the existing gears. Significant increases in human satisfactions can occur only if the school's norms, structures, and procedures are altered to give people more room to initiate their own goals and decide, perhaps collaboratively, the criteria by which they can tell when the goals are reached -- thus increasing the sense of achievement; only if they are altered to give everyone more freedom to make crucial choices and to succeed or fail accordingly -- thus increasing the sense of power; and only if they are altered to foster a great deal more joint work and camaraderie -- thus increasing the satisfactions of affiliation.

We have little formal evidence from schools that satisfaction with the job is linked with satisfaction of emotional needs. For most of our documented evidence, we have to turn to other kinds of organizations, making the assumption that the effects there are very similar to the effects in schools. Stavrianos (1976, pp. 59-60) writes:

> . . . the results of more than 100 studies done in the past 20 years . . . show that the worker's chief desire is to become master of his or her own immediate environment. Workers want responsibility and a sense of achievement, so that they can feel that their work and they themselves are important -- the twin ingredients of self-esteem. Workers are realistic enough to recognize that certain jobs are inherently dirty and arduous, yet it is not these features of such jobs that they find so oppressive; it is rather the constant supervision and coercion that accompany them -- generally servile relationship that management demands of workers.

> The reality of this frustration of the work force and its results are made clear in numerous studies by American behavioral scientists in the field of "organizational science." After surveying these studies, the sociologist Paul Blumburg concludes "There is hardly a study in the entire literature which fails to demonstrate that satisfaction is enhanced or that other generally acknowledged beneficial consequences accrue from a genuine increase in worker's decision-making power. Such consistency of findings, I submit, is rare in social research ."
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> The same judgment is reached in the 1973 study, *Work in America*, . . . "The main conclusion is that the very high personal and social costs of unsatisfying work *should* be avoided through the redesign of work . . . . Not only can work be redesigned to make it more satisfying but . . . significant increases in productivity can also be obtained."

Our conclusion is that reasonable levels of motive satisfaction are necessary to a sustained capacity for solving problems in the school. When motive satisfactions sink, the attention of individuals focusses more and more on those frustrations. Their attention and their intellectual resources become unavailable to complex problem solving in a coordinated group. Adequate interpersonal skill in motive satisfaction is necessary, however, if people are to provide one another the social satisfactions of achievement, affiliation and power.

We turn next to a closer focus on the individual human, giving attention to some special effects of the human ability to make images of images.

Images of Images: The Complex Human

The marvelous complexity of the interconnections among the billions of neurons in the cerebral cortex (Hart calls us "brain freaks") enables humans to make images of limitless possibilities and to compare them both with one another and with perceptions brought in through the senses. The comparisons, of course, are themselves images, and we are marvelously able to put images and comparisons into words: "I expected George, but Mary showed up." One outcome of the ability to compare reality with imagination is the ability to conceive problems and steps to solutions. The first part of this section will discuss the uses of that ability. Another outcome is to reconceive or revise conceptions of problems. The second part of this section will describe the functions of "upshifting" and "downshifting" in reconceiving problems.

Solving Problems

We have described the process of converting frustrations into problems in Chapter 2. Here, we make brief mention of the neurological substratum for conceiving problems and then go on to the complexities of coordinating group work on problems.

It turns out that the conception of a problem as a comparison between a present state and a possible, more desired state corresponds well with the actual functioning of the brain. We will skip over the logic of the "program structures" the brain apparently uses in searching for patterns and comparing them (for which see, for example, Hart, 1976, Chapters 8 through 13). We take space to mention, however, two important features in the formation of images. First, images of the present state are always built on previous experience. We perceive not some "real" state of things, but instead our interpretation of things as our previous experience allows us to perceive them. We search for matches between the new and the old. Hart (1975, pp. 101-102) says:

> This search process, . . . via a hierarchy of [previously existing program structures], is the basic way we recognize coded sensory inputs. It is what we mean when we say perception. If there is a match, perception occurs; if no match can be found by the search, there is no perception . . . .

Second, the self is always present in an image. If the image does not show oneself where one would prefer to be, one feels an urge to do something, mentally or physically. Hart (p. 168) says:

> We can feel fairly certain that the question asked by the frontal lobes is something like, "How does this current situation fit with my long-term conception of myself and my world?" If the fit is tolerably good, sense of security is bolstered. If the fit is marginal . . . , accomodations must be made, by revising aspects of the previous concept, or by reinterpreting the new situation with some change or both. If instead there is a gross misfit, other means of coping must be employed.

The motivating effect of a lack of correspondence between two images of the world, especially when they contain a representation of the self, has been studied by psychologists under the rubrics of "cognitive dissonance," "consistency theory," and the like. The literature on the topic is vast; we content ourselves with citing the book edited by Abelson, Aronson, McGuire, Newcomb, Rosenberg, and Tannenbaum (1968).

Some observers of human groups trying to solve problems are impressed with the erratic, recycling, seemingly random process they exhibit. Seeing so many groups act like that, the observers sometimes conclude that human groups must inevitably act like that. They claim that a group that tries to adopt a systematic procedure will fail because to do so is "unnatural." The group may think it is following a systematic procedure, they claim, but it really is not doing so, and it may as well not bother itself with trying. We disagree with that view, partly because of our own experience with systematic procedures, and partly because the theory of our own experience with systematic procedures, and partly because the theory of making images of images persuades us to disagree.

Many observers of individual humans solving problems are impressed with insights that occur--the sudden leaps to valid solutions that seem to short-cut all rationality. Neurologists agree that the brain can indeed work that way. In fact, there is a great deal of evidence to show that the right hemisphere of the brain (in most people) specializes in intuition: spatial relationships, patterns, and nonverbal ideation (see Wittrock and others, 1977; and Chall, Mirsky and others, 1978; for example). For that reason, we would be wasting the creativity and speed of half the brain if we required individuals to work at problems only systematically, rationally, and verbally. That is the reason that a systematic procedure for solving problems in a group should always allow some time for individual intuition such as a period for "brainstorming." We endorse the balanced view of Sagan (1977, p. 181):

> There is no way to tell whether the patterns extracted by the right hemisphere are real or imagined without subjecting them to left-hemisphere scrutiny. On the other hand, mere critical thinking, without creative and intuitive insights, without the search for new patterns, is sterile and doomed. To solve complex problems in changing circumstances requires the activity of both cerebral hemispheres: the path to the future lies through the corpus callosum.

In schools, solving problems that impinge on the school as a whole can benefit immensely from the intuitions and insights of individuals. If those right-brain capacities are to be brought out, individuals must be given time to be creative, without being held down to rationality, ritual or "reality." If those capabilities are to be salvaged for the use of the group, the interpersonal skills and group skills to which we referred earlier must be used delicately to prevent the creative ideas from being submerged in conformity to whatever thinking is most evident in the group at the moment.

But solutions that depend on the group or the school as a whole to make them work cannot be reached merely by bringing out individual creativity, no matter how brilliant it may be. Chaos results when one person wonders aloud whether there is a problem worth working on, another says the problem is how to oil the present mechanism, another urges throwing away that mechanism, another advocates an action step she thinks is likely to have pay-off regardless of what the problem is, another asks whether there is consensus on a goal, another asks whether the right people are represented at the meeting, and so on. Chaos grows when all those cross-currents occur while participants are unaware that they are occurring. Often, many members of a meeting assume that others are talking about the same part of the problem-working process that they themselves are talking about, without checking whether that is true. The result is that many of the remarks sound like nonsense.

At some point, individuals must be able to coordinate their actions toward a common goal, taking steps in unison toward it. At some point, therefore, there must be time for every group member to come to understand the images being seen by others and to feel familiar with them. There must be time for members of the group to compare one person's image with another's and explore the potentialities of each. There must be time to come to agreement about the advantages and disadvantages of proposed solutions and agree on the best bets. There must be time, too, to ascertain the willingness of every member to commit the energy and take the risks necessary to make the adopted solution work.

We believe the following systematic procedure for solving problems in groups (or something like it) satisfies the requirements we have set forth:

1. Agreeing on the problem. Effective problem-processing demands attention to two kinds of questions at the outset: Where are we now (the situation, S)? and Where do we want to be (target, T)? An effective group must reach a working agreement early about what constitutes their S and T. At the same time, the effective group realizes that agreements about both the S and T are inevitably temporary. Situations do not stand still; targets move into new definitions as they are approached. Further, as a group reaches new clarity about the problem that brought them together, they will become aware of problems they had not thought about earlier. The process is a natural one in human awareness and thinking.

2. Generating alternative paths. Next, the group chooses one of its targets and tries to think of steps or paths or plans (P) to get from the existing situation (S) to the target (T). We often use brainstorming in this phase. This is the phase (though it may also occur earlier or later) in which a group typically envisions a benefit from reaching deeper into its members' personal knowledge and resources or from reaching outside itself for information and resources. A skillful group can begin at any point and then oscillate among S, T, and P in its discussions. For beginners, however, we find it easier to begin at S and T.

3. Facilitating and restraining forces. Once the group has agreed firmly on the desirability and feasibility of a target (and considering Ps helps to clarify the desirability and feasibility), it can move into considering the forces that will work for and against its efforts. Among the kinds of facilitating forces groups sometimes named are publicly announced support from certain authorities, support from interfacing groups, some available money, some time already set aside for problem solving, some people already committed to the target, and some necessary skills already existing in the group. Among the kinds of restraining forces sometimes named are a debilitating history, political blocks, anticipated lack of support, anticipation of too much cost of change, and lack of knowledge or skill.

4. Prioritizing action steps. The group next chooses the restraining forces that seem feasible to reduce and generates ideas for reducing them. The group agrees on the forces to be attacked first and the best steps to use from among those proposed. Again, brainstorming is useful to generate a host of ideas.

5. Acting. This is the phase when committed action is mobilized. The group assigns people to the various actions decided upon and assigns schedules.

6. Monitoring and recycling. Meetings are scheduled at which progress will be reviewed. Working toward a target not only tests how well the situation has been understood. The work of carrying out a plan for change usually brings more information to light about the original situation

than had been known when the plans were made. The new information can call for a change of plan or even a modification of the target. Working toward a target can also bring about revised ideas of the desirability of the target as first conceived. The cost of reaching the target may come to seem greater than was imagined. People also form a clearer picture of what living in that target state might be like. They sometimes may not like the picture as much as they had thought they would. A problem-solving group should never take a particular target to be immutable. The group should feel free to alter its diagnosis of the situation, its paths to the target, or the target itself whenever changing circumstances cause an alternative diagnosis, path, or target seem likely to lead to greater satisfactions. Indeed, some authors--Weick (1969), McCaskey (1974, and March (1972), for example--claim that good planning can be done without goals at all. Similarly, Hedberg, Hystrom, and Starbuck (1976) say we should think of organizational structure as a temporary tent, not as an edifice.

At intervals, as the group goes through the steps, it should take time out to discuss how well the problem solving itself is going. Doing that makes sure that the systematic process is serving the group well instead of becoming a burdensome ritual. As a group becomes skillful, it looks at its own process, briefly or at length, whevever someone comes to feel that a step should be short-cut, lengthened, or conducted in a more fruitful way. Looking at the progress and effects of one's problem-solving method as it is actually occuring is an example of what in the next subsection we call "upshifting." It is one of the skills we will call "meta-skills" later on.

Once people become even somewhat skillful in working at problems systematically, they find it easier to keep in mind the complexities of the school organization and to include those complexities in their planning.

The problem-working group becomes a small simulation of the organizational processes with which they have to deal in the large. Phases 5 and 6 are especially fruitful in that respect.

In describing a systematic problem-solving procedure for groups, we do not mean that it will be serviceable only where individuals all conceive the problem in exactly the same way, agree wholly on the strengths of the facilitating and restraining forces, and so on. Nor do we mean that every individual must be enthusiastically committed to the steps agreed upon. The procedure is serviceable whenever no individual is so opposed to the conception or so fearful of the action steps that he or she will take action to sabotage the sequence of action. Part of the skill of solving problems in groups is that of ascertaining whether some individual feels that sort of opposition. Success in ascertaining that requires a minimal level of trust.

Once people have accepted the discipline that systematic problem solving requires and have become somewhat skillful at it, they find they can avoid a great deal of the frustration we saw so often in the schools of the DTA project. Teresa Lenoir (1977) has commented on DTA's observations of problem-processing in urban schools. She points to over-narrow conceptions of organizational problems, to bad matches between goals chosen and the real complexities of urban schools, to ambiguities in the school's relation to its environment, and to the restrictions that past images place upon the ability of school people to make feasible images of the future:

> Urban schools traditionally have a difficult time in processing problems. In spite of the pluralism of the setting, many groups are excluded from the activity, since resources are

> scarce and options are perceived narrowly. Problem processing takes on a top-down quality conforming to the hierarchical nature of school administrative structures. The processing of problems attracted the attention of the school improvement groups [consultants], and their assistance was essential in breaking traditional views of processing problems and assisting schools to formulate goals or directions. . . shared by more persons . . . than just the administrative group.
>
> Goal formulation is a major facet of processing problems, and the development and implementation of goals is . . . extremely complex. . . . Often goals are too lightly considered and too hastily formed. The models available to assist persons in the formulation of goals are often inapplicable to the real world of action. . . . In addition, the impact of environmental ambiguity on the organization and its participants often place rational goal formulation within the realm of the improbable. For many people, . . . there is a lack of clarity about the world in which they live and the causal links to the school. There is an inability to see links between the actions . . . and the consequences of those actions . . . .
>
> The contribution of the differing interests and values of sub-units , . . . legal mandates and constraints, traditions, previous history of the individuals and the organization, and the ability of individuals and the organization to assess the state of the system. . . all contribute to the difficulty of choice that lies behind goal formulation (pp. 23-24).

Shifting Up and Shifting Down

Routines, no matter how effective they may seem for the nonce, cannot ensure adequate skill in problem solving in the school. A routine, by definition, is a way of avoiding choices. It is a way of avoiding the question: "What is the better way to do this?" It requires the plodding use of left-brain rationality, not right-brain inventiveness and insight. A routine way of doing something also requires a routine way of thinking about how things can be done. If a difficulty has arisen that does not seem to be yielding to present routines, it is obvious that finding a way out of the difficulty usually requires a new way of thinking about it.

A routine is an image of how things work. A plan is an image of how things might work and it therefore contains assumptions about how things can work. A plan for solving a problem in a school embodies assumptions about how people behave and their capabilities for behaving, individually and in groups.

Assumptions always restrict alternatives. That is the reason we make them. Correct assumptions enable us to design actions that match reality and to avoid plans and actions that would abort. If we assume that people have two hands, we do not design procedures that would require three hands. If we assume that people are not mind-readers, we do not make plans that omit adequate opportunity for ordinary communication.

Incorrect assumptions rule out alternatives that might be better solutions to problems. If we assume, for example, that people must always work in group in the same way we now see them working, we will overlook the alternative of teaching them more effective ways. If we assume that most people are passive, awaiting direction from others (who presumably are not passive), we will overlook the possibility that people might treat a proposal from an administrator merely as one of many inputs with which they are actively coping and the possibility that they will find their own ways of coping with that one, too, not always ways the administrator would prefer. And so on.

A new image with new assumptions in it is the kind of thing that the right brain, whence new relationships and potentialities spring, is especially capable of producing. But right-brain inventiveness cannot be scheduled, routinized, or dragooned. Problem-solving procedures, therefore, should include times when individuals can be free from immediate pressures and routines, when they can sit back and let themselves be fanciful and playful, and when they can say to one another, "What are we assuming about ourselves and those people down the hall anyway? What if it were not true that. . .? What results might be possible if we tried something really far out, like. . .?" A sustained capacity for solving problems must include the skill of shifting upward from the present image of the world to an image that compares a variety of possible images and extracts from them a new set of conditions to be taken into account and a new set of assumptions about what is possible. Argyris and Schön (1974, especially Chapter 5) call shifting up double-loop learning and give an extended discussion of its strong effects on solving problems in organizations.

Shifting Up

The use of a requisition form can give us a simple example of what we mean by shifting up. A requisition form is part of a routine. Its use means that people assume that information about supplies needed can be effectively transmitted through the form and that receipt of the form will cause the supplies to be sent. If people have trouble getting the supplies they want, one thing they can do is to ask whether the form is being "correctly" filled out, whether the questions asked on the form are understandable, and so on. But they can also give up the assumptions that using a form is the best way to get supplies. They can then ask questions like: Is there an alternative way to convey the complicated kinds of information to the supply clerk that I sometimes have to convey? How does the supply clerk feel about being talked to via a form? When the supply clerk has trouble filling an order, how does the form affect her readiness or ability to communicate with me about the matter? In brief, we shift up when we give up thinking how to act within the given form and ask how the form fits into a larger scheme of things.

Thinking about conflict in the school is another example. We may think about conflict as undesirable and take steps to suppress it when it arises. We can shift up from that view, however, by questioning our assumption that conflict is undesirable. We can them ask ourselves how to make productive use of it. We shift up when we give up asking how to do what we are doing and ask instead whether we should be doing what we are going.

As another example, we may believe that a school can be operated in an orderly manner only if students are obedient to authority. If students are unruly, we may try to solve the problem by stationing police in the school. But we can shift up to a new view of the problem by asking whether order can be achieved by some other means than obedience.

In one school where we worked, the principal was spending much time with infractions of the dress code. After a brainstorming session with his teachers, the principal abolished the dress code. There were no unpleasant results. The pleasant result was that the principal no longer had to spend time on infractions. That is shifting up.

We gave another example at the beginning of this chapter. We said that we are all afflicted with the ability to talk about people and schools in one way while acting toward them in another. A principal may do a lot of talking about democracy in the school but rule with an iron hand. One very profitable kind of shifting up is that of developing an ability to compare one's actions with one's statements, or the actions within one's school with the school's public pronouncements--Argyris and Schön's (1974) double-loop learning. That is a difficult thing to do, but a group acting within the norms of third-party helping can be very helpful in enabling individuals to develop the skill. It seems to us that a school can hardly attain a continuing capacity for solving problems without having ways of bringing discrepancies between talking and acting to the attention of people who show those discrepancies. Otherwise, the connections between planning and action will be erratic at best and often the butt of bitter humor from the staff -- as it often was in some schools of the DTA project.

Several schools in the DTA project made radical alterations in the role relationships in the school -- a step that seems to us to require at some point the skill of shifting up. Some maintained those new role structures for several years. That seems uncommon. Emrick's (1977) study of schools adopting innovations through the National Diffusion Network (NDN) shows what seems the more typical range of outcome. Emrick tells us that the larger portion of the innovations adopted among those purveyed by the NDN do not require the school to form a new image of itself. They do not call for shifting up to new images. In Emrick's words: ". . . the majority of adoptions deal with content or methods already part of the school system's approach . . . . In most cases (84%), the innovation is a supplement or alternative to a current program or practice. . ." (p. 125). The simpler kinds of innovations are far more likely to be adopted than innnovations requiring alterations in the complexities of organizational functioning. When Emrick writes about complex organizational structures, we think he includes, as an important feature, a strong network of role relationships held in place by strong assumptions about their necessity. Emrick continues: "The majority of NDN adoptions occur within rural or suburban school systems. Urban school systems . . . account for only 20% of the NDN's reported adoptions. " A likely explanation, Emrick writes, is ". . . the complex organizational structures characteristic of urban districts. . ." (p. 132). And: "Adoptions tend to involve implementations of low to moderate organizational impact . . . . The generally moderate [organizational] level of adoptions facilitates management at the local level. . ." (p. 132). And: "Adoptions are concentrated at the preschool and elementary grade levels. . . the organizational structure of elementary schools is less complex than that of secondary schools, which makes local coordination and management as well as provision of assistance from NDN staff simpler. . . " (p. 133).

Shifting Down

We can shift down as well as up. We shift down to cope with a strong immediate necessity, as when we perceive a threat to our safety. When we shift down, we do not even ask how to do the job we are going. We put the job aside to protect ourselves against perceived danger. When our neocortex tells us we are in danger, the guidance of our behavior is turned over to more primitive structures in the brain lying deeper inside it--the limbic system. It is important to understand that "emotional behavior" is not a mark of an inferior kind of human, a result of lax discipline, or an aberration. It is a way of dealing with the world that is built into all of us. The extent to which the limbic system or even more primitive centers in the brain will take over guidance of our behavior depends less on our reasoned thoughts on the matter than on how severe we perceive a threat to be. Shifting up and shifting down are capacities (and inevitable behaviors) given us by the structures of our brains. Hart (1975) explains:

> . . . oldest and innermost [is] the "reptilian" brain. It comprises the brainstem, part of the midbrain, and some other structures plus a rudimentary cortex. Surrounding this is the "old mammalian" brain, which includes what is called the limbic system. Capping this in turn is the neocortex, or "new mammalian" brain (p. 55).

Sagan (1977) says that the reptilian mind "is not characterized by powerful passions and wrenching contradictions but rather by a dutiful and stolid acquiescence to whatever its genes and brains dictate" (p. 62). In contrast: "Love seems to be an invention of mammals" (p. 65), in whose brains the limbic system has grown to make possible a kind of social life impossible to reptiles. Along with the capacity for the mammalian sort of social life, the highly developed limbic system has also brought us the inner interpretations of experience that we know as ecstasy and terror. Hart continues:

> As we come to social animals, the need for signals greatly increases. . . . The essential point is that emotions and signals are strongly and probably inseparably linked because of their evolutionary origins and functions (p. 65).
>
> Social always implies crowding, living in groups close together. This creates the constant need to signal to one another -- the less the distance between individuals serves as a cushion or buffer to prevent sudden attack, the greater the necessity for the continual exchange of assurances of our intentions, mood, and relationships. To the postures, tensions, movements, and vocalizations animals use, humans add the enormous resources of speech -- which has led us to neglect the nonverbal aspects, or signals (p. 124).
>
> The centers [in the limbic area] represent a concentrated mechanism involved in producing the complex changes and behaviors we call emotions . . . . (p. 66).
>
> Much evidence now indicates that the limbic area is, in general, the main switch in determining what sensory inputs will go to the neocortex, what decisions will be accepted from it, and which switches will be thrown locally (p. 67).

The necessity for absence of threat if we are to make use of the creativity in our right-brain neocortex is built into the structure and function of our brains. When the neocortex interprets a situation as threatening, then interpreting further incoming information and making decisions about it get shifted into the old mammalian brain. Hart (1975) says:

> What we mean by emotions . . . is this resetting of body biases . . . To oversimplify, the oldest brain does the body resetting, the middle brain gives the orders, and the new brain provides complex and detailed analysis of the situation and gives permission for or inhibits the emotion. But the new brain, the cerebral cortex and its associated pathways, does not always win. It can be temporarily shunted out of the decision making as older, simpler circuits take over. A suitable term for this is "downshifting" (pp. 120-121).
>
> What I have termed downshifting means any emotional biasing away from fullest use of the neocortex and its resources toward

> more reliance on older, cruder portions of the whole brain system. In terms of speed, downshifting bring into use faster ways of making decisions (p. 126).
>
> The degree of downshifting will roughly be proportionate to the degree of threat perceived -- perceived, as before, meaning by the individual. There will also be a generalized bias: the less secure or confident the individual, the more readily threat will be perceived, and the faster and deeper the downshifting (p. 127).
>
> Under sudden threat the downshift may cut off even evaluating the threat, so we downshift all the more, resorting to a few traditional behaviors: run, fight, seek the comfort of a group, or the security of home or a substitute shelter. If none of these seem possible, most likely we stand rooted to the ground. . . (p. 128).
>
> . . . speech is strictly a function of the newest brain; and when we downshift hard under threat the ability to speak is usually largely or entirely lost. A very scared, angry, or surprised person may not be able to get a word out. . . . If we need familiar and dramatic evidence of downshifting, we can hardly find any better (p. 141).
>
> Under milder threat, the downshift may take a more limited form of shortening the back-and-forth process of perception input and matching. We can call this "irising," in the sense of the iris of a camera lens or the eye shutting down so that less light enters. We perceive less, and even that not so sharply, so that in effect much less input is acquired. It's as though the nervous middle brain were telling the new brain, "Hurry up, hurry up, we can't risk all that time!" Every classroom teacher has seen the effect on children: they stab at answers, guess wildly, garble, miss even gross distinctions (p. 129).

Psychologists have been investigating the effects of emotion, especially anxiety, upon perception and learning at least since the 1950s. Easterbrook (1959), with an emphasis on the processing and interpretation of sensory input, wrote one of the more insightful and integrative papers of the time on what Hart calls "irising." Easterbrook put forward the hypothesis that heightened emotionality reduces the range of cue utilization, or equivalently, that it reduces the amount of information handled by the organism; and further, that cues not relevant to the immediate task are the first to lose the organism's attention as emotionality rises. Hart would say that under threat, "cues relevant to the immediate task" are those the limbic system uses in responding to the threat.

Runkel (1959) reviewed other evidence available at the time. Runkel (1963) also offered a hypothesis similar to Easterbrook's, but in terms of the complexity of the image built: namely, that "cognitive fields of lesser dimensionality would be more likely to be found where anxiety is higher." Sarason, Davidson, Lighthall, Waite, and Ruebush (1960) reported effects on students of anxiety about being tested. Alderfer (1969) modified Maslow's theory of needs to include a feature very much like Hart's downshifting. McGrath (1970) analyzed in detail the conditions affecting responses to threat (which he called stress) and the various ways of responding to it. Reviewing studies of emotionality and group process in 1971, Shaw (1971, pp. 179-180) wrote:

> The pattern of relationships between measures of anxiety and measures of group process variables is generally consistent, in spite of the differences in measures and their potential deficiencies. The anxious individual reveals an overall picture of inadequacy in his relations to others and to the group. He has lower aspirations for the group, his responses are slower and more variable, he conforms to the norms more closely, he alters his judgment in response to the group more readily, and he is better satisfied with the group than the nonanxious individual. . . . Conformity to norms may be one means of reducing anxiety or at least preventing it from increasing. Such behaviors can scarcely contribute to effective group functioning.

The entire family of studies seems to us to be described very well by Hart's concept of downshifting.

The phenomenon of downshifting is especially dramatic under very strong emotion, as Hart points out. But it can also be seen clearly almost any day in almost any discussion in almost any school. One person may say, for example, "George, I think your plan has some weaknesses in it. One is . . . ." George interrupts: "Well, Sue, I don't think your ideas are so hot either!" The rational, neocortical response to Sue's remark would be something like, "No doubt it has some weaknesses. Let's see whether they are crucial, whether they can be fixed, or whether we can think of a plan without those weaknesses." But if George interprets Sue's remark as an attempt to belittle him -- as a threat -- then George's response is decided in the limbic system. He counterattacks. The limbic system is not very good at group discussion.

Creative problem solving is not likely to occur when the persons attempting it perceive themselves to be under threat. In many urban schools, many teachers feel threatened by possible transfers or "excessing," rejection of tax levies by voters, evaluations by superiors, demands for accountability, demands by parents for one or another kind of curriculum, demands by innovators for changes in role or changes in teaching methods, and demands from unions to take sides in contentions with administrators, not to speak of threats to their self-esteem or bodily safety from students in their classrooms and the threat to their competence from the imminent addition of "exceptional" children to their classes.

The removal of threat from the deliberations of people trying to solve problems in schools is desirable not merely because it would be pleasant in the sense of providing pleasant working conditions. It is a necessity without which creativity will not appear except from those few persons who are not easily threatened or who somehow succeed in finding some quiet moments for themselves. And creativity from a few is not enough, because the rest of the staff and students are not going to be able to share the images put forward by the few and act judiciously upon them if they themselves remain under threat.

If the vicious circle we described in Chapter 2 turns out to be impossible to break from inside the school, if staff and students cannot find a quiet eddy in the turbulent stream of urban stress that will allow them to draw out the inventiveness from the neocortex of their right hemispheres, then the only hope of solving the problems from which urban schools now suffer will lie in drastic, uprooting, traumatic intervention from outside. Unfortunately, the interventions that arrive from state and federal governments are not likely to have playfulness and exploratory freedom for the right hemisphere written into their designs. The vicious circle will be likely to re-establish itself quickly.

Help from the Group

Despite the strong and continuing stresses in many urban schools, the situation is not hopeless. It may be bleak, but it is not hopeless. Not all individuals perceive the same degree of threat from any one setting. In any group, some individuals will be using their neocortexes more than others. With the right norms in the group, those individuals can temporarily provide the rational thinking for the group.

The right norms are important. The norms must make it acceptable to betray feelings of threat in the group and feelings of non-threat also. The norms must make it acceptable for some individuals (different individuals at different times) to go farther and faster in their rational thinking than others. The group must not require a lock-step in the way it moves forward. It must prize individual differences and make use of them.

A group with norms of acceptance and trust can help a great deal to reduce feelings of threat merely through exhibiting feelings of acceptance and trust -- that is, by showing that it is one group from which members need not feel threat. The human group is a primordial haven. But human groups do not become havens by fiat. Sometimes they require special training.

We were asked to work with a group of counselors in one of the schools of the DTA project. The counselors, one and all, felt threatened by their principal and by most of the teachers in their school. They distrusted one another. They were immobilized. They were afraid to take any new step for fear their circumstances would become even worse. After we had visited frequently over a period of a few months, consistently behaving in a supportive, non-threatening manner, they asked us for training in conducting themselves in the same way we acted with them. After a few more weeks, they began conceiving and trying out a few new actions with principal and teachers. Those first steps were successful, and they went on to others. They reorganized the way they shared the counseling load. They made new rules for access of others to their meetings and announced them to the school. With a few especially troublesome teachers, they held frank discussions of the troubles the teachers were making for them. When they decided it was time to rotate the position of Head Counselor, they chose a new one themselves and simply notified the principal they had done so. Once cowering, embittered, and carrying out daily a grinding routine, they became mutually supportive, optimistic, vigorous, and boldly inventive. See Francisco (1978) for further details.

Recapitulation

Schools are composed of individual humans, and every human is a far more concentrated package of resources for solving problems than any non-human thing available to the school, whether a library, a computer, or whatever. Humans have the capacity to compare one another's images of the present state of affairs with one another's images of potential futures and to agree upon an image of the future that is attractive to all. That ability enables them to engage in joint problem solving.

Effective problem solving in a group requires norms that encourage the acceptance of individual differences, including the fact that perception is a unique individual thing, including the view that solving difficult problems will usually require shifting up to new assumptions, and including permission to discuss perceived threats in the group--regardless of whether the threats are perceived as arising from inside or outside the group.

Solving complex problems in the school requires insight, inventiveness, exploration, experimentation, and challenging old assumptions -- the kind of thinking carried on in the cerebral cortex, especially in the right hemisphere (in most people). When people feel threatened and emotion rises, thinking shifts down into limbic area of the brain where a great deal of incoming information is screened out of attention, judgments are rough and ready, and decisions swift. Action guided by the limbic system is action oriented toward safety immediately, without deliberation. It is traditional, tested (over millenia), simple, and uninventive. Effective problem solving in schools requires surcease, at least occasionally, from the constant turmoil that is perceived by almost everyone in urban schools, at one time or another, as containing threats to their welfare.

Dealing with the Environment

In addition to all the complexities arising inside schools, complexities arise from the interdependence of the school with its environment. Urban schools are open to communication and influence from the central office, the school board, labor unions, parental groups, taxpayers' groups, the State Department of Education, agents or contractors of the federal government, civil-rights organizations, the courts, the city council, the fire department, and individuals from all walks of life who may communicate with a student, counselor, teacher, principal, secretary, or janitor. As is the case with any open system, schools not only receive inputs from their environments, they also put outputs into their environments: their students after they graduate have abilities different from those they had when they entered; teachers and bus-drivers spend their money in the community, members of the school give talks to local groups and professional organizations, members of the school board give speeches during election campaigns, and administrators testify before committees of the legislature.

When solving problems, a school depends both on its interior resources and the resources it receives from outside itself. Indeed, it sometimes uses its interior resources to obtain resources from outside, as was dramatically the case when a principal and his neighborhood school board in one the schools of the DTA sought financial aid from the city, the state, and the federal government so that the school could reduce its dependence on the school district.

The input from the environment can be both helpful and unhelpful. Money, for example, is necessary to maintain many functions of the school. But money from non-routine sources, such as grant money, can overload the existing role-relationships the school has for handling money and what it can buy. The result is sometimes stressful overload, as we said in Chapter 2. Conversely, what looks at first like unhelpful input can turn out in the end to be helpful. Criticisms from parents, for example, can at first bring unwanted stress, but later enable the school to establish more productive relationship with its community.

Every organization, like every individual animal, has sensing devices through which it takes in -- and screens -- information from the environment. (It also has devices for taking in matter and energy from the environment, but that is of minor concern at this point.) Principals channel information from the central office -- they bring it in, and they also filter it and change it for internal consumption. Teachers, students, and others bring in information from parents. And so on. But every school is better at getting some kinds of information than others. Channels from the central office are often fairly effective. Channels from parents, on the other hand, often bring in information from unrepresentative segments of parents and can be misleading. The school board often gets information from parents only after a considerable number of parents have developed hostile feelings. Channels for financial information often bring information about an emergency only after the emergency has already come into being. Channels that bring information about new ideas for schooling -- the research department, university summer schools, visiting lecturers -- often bring the information at the wrong time, when the school is already overloaded with innovations, when the needed support people are not present to get their part of the information, when recipients do not have time to translate the language of the information into the terms of their own situations, and so on.

A school with a strong capacity for solving problems will examine its channels to the outside world and compare what they bring with what it judges it needs. It will clamp down channels that bring little useful information (or materials or energy) and open wider channels that bring useful information. It will build new channels where that seems the better course of action. An example is the school in the DTA project which, together with its consultants, built skill and unity in groups of parents so that they could communicate more effectively with teachers about their children's education. Whether input is useful, of course, depends on the skill of the school in using it. We commented on the kinds of skill necessary in several previous sections. Later, we will list the skills of getting timely and pertinent information and other resources as crucial to a continuing capacity for solving problems.

A school with strong capacity for solving problems will also examine its outputs to estimate the effects they are having on its inputs. Tracing those effects, of course, is not a simple matter. The school will often want to bring in consultants to help.

We have now described six layers of functioning of schools and their members. We have set forth the crucial kinds of complexity in each layer with which effective problem solving must cope. Each layer of complexity has its own peculiar pitfalls. We turn next to a review of them and precautions against them.

Avoiding Pitfalls

Openness to Environment

One mistake you can make in trying to solve a problem is to forget the acquiescence or cooperation you may need from the environment. When you set out to change the curriculum, you may forget to discuss the matter with the Director of Curriculum to make sure that she will not feel threatened when she finds out about it. That may seem an unlikely error, but it happens. During the early months of President Carter's term of office, news stories often claimed that he neglected to clear his legislative programs with members of Congress who could crucially affect their fate. A similar error is failing to look for interdependencies with the environment of which you may not at present be aware. Administrators sometimes find that they have run afoul of a law of which they were ignorant.

The first error we mentioned was an example of forgetting the crucial characteristic of the oepn system: its interdependence with the environment. The second was not that error, but the error of supposing you already know all there is to know about that interdependence. Those errors can be avoided by establishing a subsystem in the school (a tickler on someone's calendar, a committee, or whatever) that will periodically review the school's connections with the environment -- whether it has been bringing in what was needed, how often it has been right in predicting the effects of its output on the environment, and so on.

A third kind of error is that of supposing you can affect the school's outputs (such as its effects on students or the morale of its teachers) to whatever degree you like if you just find the right inputs. That is, you can understand that the school is an open system, which is correct, but you can then make the mistake of supposing that it is no more than an open system -- that its behavior can be fully controlled by its inputs. Again, that seems an error almost too elementary to mention. But though few might make the claim in words, actions are often taken that seem based on the assumption. School boards, state departments of education, and the federal government make the error repeatedly. McLaughlin (1975, p. 49) cites the testimony of Daniel Moynihan when he appeared before the House Subcommittee on Education in 1968:

> We had thought . . . we knew all that really needed to be known about education in terms of public support, or at the very least, that we knew enough to legislate and appropriate with a high degree of confidence. . . . We knew what we wanted to do in education, and we were enormously confident that what we wanted to do could work. That confidence . . . has eroded. . . . We have learned that things are far more complicated than we thought. The rather simple input-output relations which naively, no doubt, but honestly, we had assumed to obtain in education simply, on examination, did not hold up. They are not there.

Administrators, too, often make the error. One example will suffice. In one district within the DTA project, we saw the superintendent issue an edict that every school would establish a curriculum study group. Administrators from the central office provided those groups with detailed check-lists on which they were to testify to whether they had taken every step prescribed by the central office. Persons connected with those groups were required to attend "workshops" at which they were lectured on what they were supposed to do and by what date. At one workshop, an assistant principal, unhappy with the procedures to which he and his colleagues were being subjected, offered vigorous criticism. A central-office administrator ejected him from the meeting, telling him he could return when he was willing to suppress his opinions. That central-office administrator, obviously, believed (in action if not in words) that the edict and the workshops, treating everyone uniformly, should produce the intended results without any attention (except trouble-shooting) to individual differences. When the assistant principal behaved differently from the rest, the administrator did not question her own understanding of the nature of the living system, but merely acted as if one of the working parts, so to speak, was showing a temporary malfunction that could perhaps be corrected by a sharp kick.

The error of supposing the school to be merely an open system (an input-output machine) can be avoided by keeping at hand a strong reminder of the other, more complex characteristics of the system. When setting in motion a process to solve a complicated problem, the school can make use of a planning group or advisory group in which norms for open communication have been established. That group can then serve as a testing ground in which to anticipate the interpersonal and subsystem complexities that might arise. If someone says, for example, "That plan would make me change my whole way of working with the counselors," the chances are that others outside the group would have similar worries.

Aside from the errors about open systems that can be made, it is also important to estimate the inputs from the environment about which the school can do little or nothing. It may be, for example, that a reduced district budget, perhaps in combination with rules for claims on jobs agreed to with the teachers' union, will be likely to change the membership of the teaching staff in the near future. Or perhaps court ordered desegregation is about to do so. It would usually be a waste of time, under such circumstances, to undertake problem solving that would require building strong trust and coordination among groups in the staff, because those groups would soon be broken up and the work would have to be done over again. Some conditions that affect schools must be altered through social processes lying outside the school: legislation and lobbying, voting, money from foundations or the government, neighborhood organizing, and so on.

Images

Like individuals, schools have images of themselves. Formally, the images are represented by the school building and its upkeep, by handbooks and pamphlets describing the school and its goals, and so on. The image is also exhibited in the norms of the school which can be discerned when people say things like, "That's the way we do things around here." Some images have an air of competence and optimism; some carry a miasma of impotence and gloom. Problem solving should begin with a careful diagnosis that seeks an accurate picture of the image of the school held by insiders and outsiders and the degree of agreement about it. The investigators should also find out the degree to which individuals in the school are correct about the images other individuals hold about the school. Sometimes there is a great deal of pluralistic ignorance about such matters.

One thing it is important to discover is the image people in a school have of what it would take to make their school more like what they want it to be. That image gives clues to the image they have of the nature of the system of which they are a part. Many people in urban schools, for example, are impatient with a proposal for a change project lasting as long as three or four years. They say, in effect, "If you can't improve at least something around here in a few weeks, don't bother us. We have enough trouble with all the demands on us now, without adding another. Fix something quickly, or get out." Their image of their organization seems to be a mechanical one. The machine is overloaded, they seem to be saying. The gears are grinding, and it ought to be possible to replace a part here or a part there that would loosen up the stresses and enable things to run a little more smoothly. Such a school will indeed require three or four years to solve their organizational problems.

Images of Images

Because individuals can compare images of the present with images of the future, they can solve complicated problems rationally. They can anticipate difficulties. But when they work together with others, they can make mistakes about the images others hold. The first error that hopeful problem solvers can make at this layer of complexity is to suppose that good intentions and hard work are sufficient for a group to produce eventually a workable solution to a problem. Coordinating the work of separate cortexes is a complex and delicate matter. Special skills are needed to keep the group working together as it moves along. This first error can be avoided by making use of a systematic problem-solving procedure such as the one we described in the earlier subsection on "Solving Problems."

The second error that can be made is to assume that people can use the rational and inventive neocortical parts of their brains whenever they "set their minds to it." The fact is that their ability to do so will decline when their emotion has been heightened by threat. Perceiving a little threat, they will "iris" incoming information; they will pay more attention to information that will help them deal with the threat than they will to other information. Their creativity will decline, because creativity works best when a great deal of various kinds of information can be taken in and be dealt with in a relaxed mood. When perception of threat increases, people will limit themselves almost entirely to hunting for ways out of the threat. They will cast about for quick solutions, make quick judgments on very little data, become impatient, and develop simple orientations such as, "You're either for me or against me." When perception of threat becomes overwhelming, people may become unable to speak coherently or even move their feet.

Very simple tasks -- tasks simple enough to be dealt with in the limbic system -- can be done well under conditions of strong threat. If you want a child to stop talking for the next moment or two, you will get sure-fire results with a loud shout. That technique, however, will not help the deliberations of a problem-solving group.

The way to avoid the second error is to provide sheltered settings where problem-solving groups can get away from the situations that are ordinarily heavy with threat for them. The group should be given every support and help. It should not be pushed to act rapidly. It should not be threatened with evaluation. And so on. It sometimes takes several months to bring a group to the point where most or all its members believe they are out of danger.

Two Persons

In this layer of complexity, we emphasize the skills of communication and the skills of enabling others to maintain activity, achievement, affiliation, and power.

One error that can be made here is to suppose that people will "understand" an idea, a proposal, or any kind of communication, if it is just "expressed clearly." We gave reasons earlier when we were discussing the matching of images and the uniqueness of individuals. The best test of understanding we have is in action. If people can coordinate their actions so that steady progress is made toward a goal, then we can be as sure as we ever can be that their communication amongst themselves has resulted in fairly similar images. But if coordination goes by fits and starts, with participants at some times helping things along and at other times getting in the way, at some times absent and at other times present, we can be sure that images still have important differences. The way to avoid the error of supposing there is understanding where there is not is to maintain constant checks of the sort we mentioned in the section on "Groups: Norms and Mutual Helpfulness."

The second error is to suppose that people move only when someone else pulls or pushes them. (Who pulls and pushes the pullers and pushers?) Here, again, one often finds a discrepancy between talking and acting. "I'm going to give you a chance to act on your own. I'll tell you what the problem is, and you can solve it in your own way. We have to get the revised curriculum ready by December tenth. However you want to go about it is fine, as long as . . . ."

Humans are always active. Even when they are lethargic or asleep, their brains are scanning possibilities for action. In the section on "Two Persons: Interpersonal Relations of the Social Animal," we sketched the ways that the social motives can be satisfied so that the optimum functioning of individuals in the school can be encouraged.

Considering the fact that most of us were brought up to believe that people have to be pulled or pushed, considering the fact that most administrators have been trained to exercise authority above all other forms of influence, and considering the fact that most schools are organized hierarchically, it is usually not easy to avoid this second error. But the school's capacity for solving problems will not rise very far unless it is avoided. The way to avoid it is to put the social motives into the consciousness of people in the school by reviewing periodically the extent to which they are being satisfied. That can be done by a tickler file, by a committee, by anonymous survey and feedback, by calling in consultants,by periodic retreats, and so on. Difficult things worth doing are worth institutionalizing, not leaving them to luck.

Groups

The error here is to suppose that skillful individuals automatically make skillful groups. They don't very often. If a group is to work well as an entity, its members must learn how to work with those actual individuals in that grouping.

The error can be avoided by allowing work groups time to find their way into good coordination and by encouraging them to examine explicitly what is helping and hindering them in their coordination. In a school where trust is low and norms operate against collaborative work (a frequent condition in urban schools), consultants should be brought in to give direct training in group-building.

School

The error here is to suppose that skillful groups automatically make a school skillful at solving its problems. They don't necessarily. Skillful groups are the basis, but not in themselves the full capacity. To solve problems of the school as a whole, two things are necessary: (1) the groups formed must comprise subsystems and (2) the groups must coordinate (interface) effectively with one another.

The error can be avoided first, by making sure, when a working group is formed, that it contains the people necessary to perform the function it is intended to carry out or people who can become effective representatives of other groups who must help carry out the function. In most cases, the proper people can be identified without much error. The second thing to do is to build strong interfaces in the same way that strong task groups are built. There are subtleties in doing that, of course, but we do not have space to lay them out here. We have set forth the main principles throughout the chapter. We will return to the sequence of individuals, groups, and interfaces in Chapter 5.

Recapitulation

Throughout our suggestions for avoiding errors, we have suggested setting up specific mechanisms or routines to check on whether complexities of organizational functioning are being forgotten. We have also suggested special training for groups or interfaces when new interpersonal norms are required -- when people may not be able to perform the functions required of them if they work according to existing norms. An example of a new norm that may be needed is increased frequency of checking the meaning of communication to be sure that images of the future are matching. Another is expecting planning meetings to be designed so that they are reasonably free of evaluation, close deadlines, or other features that would be perceived as threatening.

Pledging that one will not forget the organizational complexities is not enough. In the enthusiasm of setting out on a problem-solving project, in the flurry of getting a proposal off on time to a funder, or in talking to powerful people who believe that your school staff will solve a problem in five weeks if you just push them hard enough, it is too easy to forget the pledge. If the school is to develop a sustained capacity to solve problems, it is vital that it institutionalize precautions against over-simple solutions. Whether it uses periodic reviews by existing groups to look for possible errors at the six layers of complexity, whether it builds new subsystems to do so, whether it uses periodic retreats of the whole staff, or whether it periodically calls in consultants -- the particular mechanism is less important than having one.

One should not, however, turn over the job of checking for errors to a single person. One reason is that people will "own" revisions of plans better if they participate in them. Another is that a group has more resources than an individual for dealing with complex perceptions of school and environment.

In this section, we urged checking (1) whether the connections to the environment of the school are working in a way to help the change project, (2) whether persons' images of the school are in agreement, whether the images are optimistic or pessimistic, and whether their images of the future are in agreement, (3) whether people are ready for the hard work of coordinated, systematic problem solving and whether threat-free settings can be provided for it, (4) whether provision has been made for checking on communication skills and improving them where necessary and whether satisfaction of social motives is being provided, (5) whether provision has been made for working groups to develop skill in working as teams, and (6) whether provision has been made for developing effective interfaces.

But having given that advice, we now take part of it back. We do not really advise setting up separate procedures or subsystems to check separately whether each layer of complexity is being adequately anticipated in a problem-solving sequence. To do so would add unnecessarily to the complexity of the organization and role relationships in the school. We believe that keeping in touch with the school's complexity can be done more simply than that. In most schools, one group can review all layers of the school's functioning. In small schools, the entire staff can do it as a body. The review will be more accurate and effective, of course, if students are included in the deliberations. But we do stick to our recommendation that the reviews be periodic and institutionalized.

There is another way that alertness to complexity can be simplified. Maintaining alertness to complexity, whether during stability or during change, requires skill. We believe we have discovered four skills that can insure a school against overlooking its complexities at whatever level. We conceived the four skills during the DTA project as we watched and observed the crucial points in the change projects at which skill seemed to fail. Our specifications for the four skills owe a good deal to our experience previous to the DTA project, but the way the four skills "package" the subskills needed to maintain problem-solving capacity is a categorization that evolved during our experience in the DTA project. We will devote Chapter 4 to a discussion of the four skills and return to them again in Chapter 5, but we list them briefly here:

1. Diagnosis: skill as a group at diagnosing the current functioning of system or subsystem.
2. Searching for information and resources: skill as a group at initiating and carrying through searches inside or outside the school for information or resources when needed.
3. Mobilizing synergistic* action: skill at mobilizing the action of members and of the system or subsystem as a whole with a coordination that accomplishes more than the same number of individuals could accomplish separately.
4. Monitoring the first three skills: skill at periodically assessing the levels of the first three skills in one's own system or subsystem.

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* The word synergy comes from biology, where it means the action of two or more organisms to achieve an effect of which each is individually incapable. We use the word similarly, to mean an achievement of a group that is greater than the mere aggregation of individual efforts.

Summary

We have said that any school is a very complex entity. We have said that members of schools can find things going wrong when they ignore the complexities, and that is especially true when they set in motion problem solving that will require changes in role relationships. Hanson (1978, p. 4) expresses it this way:

> . . . "images of reality" are rooted in differing assumptions about such critical issues as, for example, rationality and limits to rationality, authority and power, organizational control, incentives, and the like. . . . Hence, if educators use the wrong conceptual lens in description, analysis, and prediction or use a "flawed" lens, they find themselves throwing the wrong net into the wrong pond at the wrong depth and catching fish they are not after. . . .

We have said that although many people can say the things we have said about school organizations in this chapter, it is more rare to find people acting with awareness of the behavioral potentialities of schools and their members. It is easy, too, we said, to forget through sheer daily familiarity how very complex schools are.

We have tried to do three things in this chapter. First, we wanted to remind the reader as dramatically as we could of the phantasmagoric complexity that faces those who want to move a school into a lively and continuing capacity for solving its problems. Second, we wanted to explain the complexities we had in mind when we worked out the specifications for the four skills that we believe will help people deal with the complexities in all six layers -- the four skills we will describe at length in the next chapter. Third, we wanted to explain what we mean by two further variables we think extremely important: (1) the amount of understanding people in a change project have of the characteristics of humans that we have described in this chapter and (2) the amount of understanding people have of the characteristics of human organizations that we have described. To be more specific, we mean:

(1) the degree to which people engaged in solving problems conceive humans as complex and inherently active, self-motivating, creative, and capable of unending varieties of conceptions of the world they live in, and

(2) the degree to which people engaged in solving problems conceive human organizations as complexly built of subsystems and inherently multiply-motivated, full of multiple complex images of themselves and their environments, full of creativity, subject to conflict that naturally arises from their creativity and their disparate images, and subject to conflict that naturally arises from impulses to different actions under threat.

You may think of those two variables as knowledge, or you may think of them as skill. We think of them as both. We think it is important for people engaging in serious problem solving in schools to "know" those things (and the rationale behind them that we gave in this chapter) in the sense of being able to talk about them with colleagues. But we also think it is vital to act on those assumptions toward colleagues during the changes required by problem-solutions and afterward. The two variables will appear in the list of variables in Chapter 5.

We turn next, in Chapter 4, to the four skills that we believe can deal with the complexities of humans and their skills that we set forth in this chapter.

Chapter 4

META-SKILLS

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Chapter 4

META-SKILLS

Any task requires some skill (not counting automatic sequences such as swallowing a morsel of food, though even in that case people do choke sometimes). But in addition to the skill required to do the task itself, there is another skill that can be brought into play--the skill of consciously observing one's application of the task-skill. Here is an example from carpentry. If one's task is to saw off a board, one can put one's attention on getting that done: finding the board, putting it on the saw-horse, finding a square, drawing a line across the board, and sawing along the line. But one can also put one's conscious attention on one's application of the skill of sawing: on the height of the saw-horse in relation to one's knee, on one's stance in relation to the line, on how one's fingers guide the first few strokes, on the swing of one's arm and the feedback one gets from the slide of the saw in the kerf, on the amount of change in direction one gets in the kerf from a certain amount of twist applied to the blade, and so on. Obviously, the second kind of skill provides one the opportunity to improve one's skill in the task of sawing off a board.

We gave an example at a much more general level in the previous chapter. We said that a person can have customary ways of behaving in a school and also customary ways of talking about his or her behavior in the school, and that sometimes those can be very separate skills. But the skill of putting one's conscious attention on the correspondence between one's actions and one's words is another example of a meta-skill. The meta-skill does not directly get the work of the school done nor the talking about it done, but the meta-skill enables improvements to be made in both the task skills.

In common language, a meta-skill is the skill of standing to the side and watching yourself. In Hart's term, it is "upshifting." In doing a task, you put your attention on the task. With a meta-skill, you put your attention on how you put your attention on the task. In the language of our Chapter 3, you form images of images. In the language of process consultants, this is the difference between task and process.

The four meta-skills we will describe here are "process" skills at a very general level. They are applied not merely during meetings, but in all aspects of the organizational life of the school, both in the short term and the long, within subsystems, between subsystems, and in the school as a whole.

The meta-skills are not new. All human organizations do these things and have always done so. The point is that they can do them well or badly. Most urban schools do not do them well enough. If schools have adequate meta-skills, we believe they will be able to keep themselves aware of the complexities we described in the two previous chapters, and they will be able to take advantage of the opportunities in those complexities. They will be able to sustain a strong capacity for solving problems.

For simplicity, we couched the examples given above in terms of an individual's skill. The four meta-skills to be described below are, however, skills of group and school. They include and require individual skill, but they go beyond that to the synergy of the group and school.

Diagnosis

We mean by diagnosis the systematic inspection by school or subsystem of its own current functioning. We do not mean merely asking whether the group or school seems to be getting along with or without troubles. We mean asking whether what the group or school is actually doing matches the way the members talk about what they are doing, and then whether what they are doing is what they want to be doing. We do not mean merely a yearly review--though that is usually a good idea; we mean to include formal and informal diagnosis as often as necessary to prevent radical, stressful reorganizations in response to crisis.

Frequent diagnosis is vital because, if only for one reason, it is always the first step in systematic problem solving. It is what one does to ascertain the present situation and the features of it that the subsystem or school wants to expunge in favor of something better. When current diagnostic information is on hand, solving a problem of any sort can get started more quickly.

By *systematic* diagnosis, we mean two things. First, we mean collecting current data in a manner that will give answers in which one can have reasonable confidence. If information is sought about what frustrations people are feeling, for example, it will not do to ask only the principal, nor to ask faculty for oral statements at a faculty meeting. Methods are needed that will survey all the important segments of subsystem or school and that will enable respondents to feel safe in answering. We are talking about the kind of assessment that professional evaluators call formative evaluation--data to aid decisions about what to do next. This is not the place to go into technical detail. For advice on systematic diagnosis, see (among other sources) Chapter 2 of Schmuck, Runkel, Arends, and Arends (1977).

Second, we mean using some sort of check list, written or mental, to make sure that some important aspect of organizational functioning is not forgotten--to suggest the kinds of inquiries a meta-skill in diagnosis might prompt problem solvers to undertake. The particular list used is not as important as having one, as long as it does in fact remind the user of the important features of organizational life. One kind of list is embodied in Chapters 3 through 8 of Schmuck, Runkel, Arends, and Arends (1977). We offer below a check list that makes use of the concepts in the two previous chapters of this document.

Check List

We present our check list in the form of questions about various features of the functioning of the school. We do not, of course, suggest that people conducting diagnoses in schools should use these actual words. Specific questions and wording should suit the local situation and the local ways that students, staff, and parents talk. Sometimes, in fact, a question need not be asked verbally or directly of individuals; sometimes the information can be gotten from school records or from the personal experience of the diagnosing group. We turn first to the matter of questions a diagnosing group might ask about achieving outcomes in the school.

Outcomes. A group diagnosing the functioning of the school may or may not want to investigate the extent to which the school is achieving some commonly accepted overall goal such as teaching some specified content to students. The questions of how to do that, however, and if it is to be done how to do it, are not as simple as they may seem at first blush. We do not have space to lay out the subtleties here; the technicalities, values, and matters of judgment in assessing outcomes have been treated by (among others) Apple, Subkoviak, and Lufler (1974), Borich (1974), Bowles and Gintis (1976), Brickell (1978), Charters and Jones (1975), Coleman (1972), House (1973, 1976), Pondy (1977), Postman and Weingartner (1973), Schmuck, Runkel, Arends, and Arends (1977, Chapter 11), Shields (1973), Spring (1976), and Stake (1967). March (1972) and Weick (1969) have written on the more general question of whether pursuing a specific goal is the healthiest thing for an organization to do. In the meantime, persons conducting diagnoses might (or might not) wish to conduct inquiries such as the following:

1. What are students able to do when they come into the school or into a course? What are they able to do when they go out? What new competence or understanding do they acquire?
2. What are staff members able to do when they come into the school? What are they able to do when they go out? What new competence or understanding do they acquire?
3. Are students and staff satisfied with the proportions of their time they spend on various tasks?

Conceiving problems. The remaining categories of inquiry correspond to the aspects of organizational functioning we discussed in the previous two chapters. Questions 4 and 5 point to the school's ability to convert frustrations into problems.

4. What demands from the environment frustrate students, staff, or parents? Which of them do they interpret as problems, specifying the present state and a more desirable state?

5. What actions within the school frustrate students, staff, or parents? Which of them do they interpret as problems?

Vicious circle (see Chapter 2)

6. What special projects lately have invigorated students, staff, or parents? What projects have failed, and what was the effect of the failure on students, staff, or parents?

7. Where are the crucial overloads? Underloads?

8. Is the mood of the school optimistic or pessimistic? How much available energy does there seem to be, and in which groups is it concentrated?

See also questions 4 above and 9 below.

Environment

9. What additional information about environmental events seems needed? What presumed information about the environment might actually be wrong?

See also question 4 above.

Images

10. To what extent are individual differences of students, staff, and parents being used as resources? To what extent, conversely, are people being treated as if they will all respond alike to requests, directives, or conditions in the school--and as if there is something wrong with them if they don't?

Images of images

11. When people say they are engaged in solving a problem, how good is the coordination in the group? Do they agree on the stage they are in? How well are they using the four meta-skills? Are the individuals engaged who will be carrying out the actions?

12. Are people encouraged to use intuition, insight, hunting for patterns and connections, as well as analysis, reason, and logic?

13. To what degree do the descriptions the school gives of itself correspond to its actions?

14. How often during the day, week, or year do individuals, groups, or the school as a whole seem to be "downshifting" --running away from a threat, reacting combatively, or taking refuge in the bosom of the group?

15. To what extent do people help to reduce the effects of threat by checking evidences of the intensity of the threat, seeking additional resources, calling on the more confident individuals for analysis and suggestions, offering the comfort and support of the group to those who are fearful, or using systematic problem solving to try to reduce the sources of the threat?

Interpersonal relations

16. What motives are being satisfied or frustrated in the school? Which persons are being repeatedly deprived of the satisfaction of achievement, affection, or power? What conditions, policies, or norms are helping to frustrate motive satisfaction?

Groups

17. Do people feel they are expected (are there norms) to clarify communication, to take emotions into account as part of the reality of the situation, to encourage divergent thinking, to check on the stages of problem solving, to call for information-gathering when more is needed, to check trust levels, and to use the meta-skills?

18. In meetings, do members share and rotate the various "process" functions needed to make the deliberations productive?

19. Do two people or two groups having a hard time communicating well call in a third person to help? Do the third persons help skillfully?

School

20. Are all members of two interfacing groups adequately knowledgeable about what the two groups are doing?

21. Do administrators and other concerned persons have an adequate picture of how all the subsystems are fitting together?

Places and Methods

Diagnostic activities are carried out in many parts of the school organization and by many different methods. Diagnostic activities can be carried out by individuals, groups, or the school-as-a-whole. Examples of diagnosis by individuals include: a teacher checking over assignments turned in by students, a principal investigating enrollment figures for each classroom, and a parent listening to a child read aloud and using a checklist to ascertain difficulties. Examples of diagnosis by groups include: faculty members using a survey procedure to learn how each member feels about attending a retreat with parents, a counseling department keeping a record of how many students request each class but can not be admitted, and an administrative team examining the engineer's report of structural deficiencies of the school building. Examples of systematic diagnosis by the school-as-a-whole include: arranging for students to take achievement tests in the fall of each year so that end-of-the-year comparisons can be used to evaluate instructional programs, sending parents a questionnaire on which they can indicate the school's instructional offerings they think more important and less important, and hosting a visit from a credentialling team and later receiving evaluative feedback on the functioning of the school's program.

Non-systematic diagnostic activities can occur orally in groups within the school, and do so very frequently. In many schools, informal, non-systematic conversation gets more time from teachers than any other kind of diagnosis. We will give some examples in the next sub-section.

Where Schools Are Now

We have given a somewhat ideal image of how systematic diagnosis might proceed in schools. We turn now to some examples to give at least a tentative answer to the question: "What sorts of diagnoses do schools actually carry out, week in and week out?" Our examples come from the observations of DTA's Site Researchers at several of the funded research sites.

In January of 1977, we searched DTA's field data that had by then been entered into the computer. As we explained in the Preface, a Site Research at each of the nine funded sites wrote information about the local project on "field data forms," and every short paragraph was coded. The codes enabled us to call out those paragraphs we believed would illustrate the topics of this chapter. We found several hundred relevant paragraphs. From the several hundred, we selected paragraphs that seemed to us easiest to understand and edited them sligthly so that they would be understandable in this chapter.*

Readers should keep in mind that the examples to follow occurred at different times and in different sites; we have eschewed dating them or naming the sites, since we will not provide enough of them here to present a thorough picture of one site or one period. We note, too, that NIE's funded sites (DTA's research sites) are not a cross-section of U.S. schools. They probably do not include the schools most skillful among those in the nation in dealing with problems; on the other hand, the schools at the funded sites are no doubt more skillful than many. Here is what we found about systematic diagnosis at the funded sites.

Informal conversation. In the schools of the DTA from which we are drawing our illustrations of diagnosis, the most common form of diagnosis was not systematic in any way; it occurred as informal conversation in face-to-face groups without any systematic data-gathering beforehand or afterward. In the first illustration, an assistant principal orally assesses the state of discipline in the school: "there had been a breakdown of responsibility for discipline." Instead of letting the deans in the school carry out their responsibilities, "many of the coordinators of special programs had been serving the function of deans." Here is the Site Researcher's full paragraph:

---

* To refer to the projects at the funded sites, we use the pseudonyms chosen by Lenoir (1977). The largest numbers of field data forms from which we drew our examples came from the Coalition for Business and Education Collaboration (CBEC), from the Responsive Education Program (REP), and from Washington Neighborhood School Board (WNSB). A smaller number came from the Junior High School Network Project (JHSN). The Site Researchers contributing field data forms were Jacqueline Davis, Chitra Karunakaran, Robert Brown, and Gerald Gordon. We have also copied examples from the DTA documents by Lenoir (1977) and Hyde (1977).

> At a meeting of the principal's cabinet, the assistant principal for administration stated that, given all the special programs in the school, there had been a breakdown of responsibility for discipline. He stated that many of the coordinators of special programs had been serving the function of deans. The group agreed that guidelines for responsibilities should be delineated.

As is naturally to be expected, the assistant principal's brief diagnosis occurred as part of a flow of events. Indeed, the paragraph recounts a very quick cycle of problem solving. The group seems to have tacitly accepted "good discipline" as the target. The assistant principal went on to assert that a couple of forces holding the school back from that target were "all the special programs in the school" and "coordinators serving the function of deans." The group them proposed a solution: delineating "guidelines for responsibilities." That quick flow of events, with the diagnosis deeply embedded in them, is typical of diagnoses in informal conversation. It is typical, too, that no additional information was sought.

The next example is taken from the middle of a conversation between two people. It consists entirely of descriptive statements about the present situation:

> Person X feels the teachers' union is not doing much to help at a particular school. The representative of the teachers' union feels there are too many personal conflicts among staff there. "If a group of teachers does get together around a solution, they still must confront the principal about implementation, and he's not easy to talk to."

Below, a principal orally diagnoses the functioning of a meeting. At the end of his remarks, he proposes a target -- to zero in on specific issues:

> The principal made a process comment: that the group was circling issues and not dealing with issues concretely. He stated that the behavior was typical of other meetings of principals. He said, "Everyone is spinning off, it turns into a giant bull session--we have to zero in on specific issues. That's the group process, but I'd like to see it refined."

In the next example, Person X gives a description of the state of affairs that existed before the change project began. She contrasts that state of affairs with the "warm support" the project is bringing about:

> Person X says that to "humanize" the school meant to try to create conditions warmly supportive of teachers and children. She said teachers and children were used to functioning in restrictive. self-contained classrooms. She said teachers were afraid of depending on one another or of admitting that they did not know how to teach a certain piece of curriculum. Each teacher shut the door of her classroom. The consultant's task was to get each teacher to open her door.

Systematic diagnosis. Below are some examples of systematic diagnosis; they mention or imply planning in advance, multiple sources of judgments, thinking about suitable criteria, representative sampling, and even follow-up interviews with students who have gone on to other schools.

> The consultant says parents have done evaluation. Parents at this school have recorded their experience with their own children in open corridor classrooms. This illustrates "multiple sources of judgments." Teachers similarly, in their staff meetings and with advisors, do evaluations based on their knowledge of children. Parents understandably have felt very depressed by the lack of money available for alternative methods of evaluation and by the fact that evaluation designs are usually funded that pinpoint ostensibly "very objective criteria."
>
> Parent NS says parents made the decision to initiate interviews of parents during the spring. Parent BH said she could recruit 4 or 5 parents as interviewers. Parents JR and GG felt they could ask one or two parents to serve as interviewers. Parent CD felt that with the environment of parents in protests against the shortened school day, interviewing efforts could not realistically begin till after the spring break. However, she would make an effort to get parents involved before then.

> The information was gathered from a series of interviews in each school with participants, non-participants, teachers, administrators, students, and parents. The participants in each school were selected by a member of the action-research team and the coordinator.
>
> Parent NS says that one suggestion for evaluation that is already being considered is to sample parents of seventh-grade children to find out their reactions as their children leave open corridor schools and enter junior high schools. She mentions that parent MN, from school B, adds that it might be valuable for this group of parents to also interview children who have left the open corridor program to enter traditional classrooms in junior high schools. She thinks children are at the age old enough to be able to recollect their experiences in elementary school. Parent GG says that the same thing might be done with children who are graduating from school A. This is school A's first batch of children who have had open-corridor education all through elementary school.

One project (REP) regularly kept logs as a ready source of diagnostic information. Lenoir (1977) reports:

> Assisters keep a log or written record of their activities in the schools. . . . Logs are used as the basis of small group discussions, large group workshops, and for the planning of the on-going work of the assister in the schools (p. 36).

Sometimes outside evaluators furnished interim diagnoses:

> The FDP project . . . employed Western Research Associates to conduct their end-of-year evaluation. Several recommendations were made. . . . The project director used the evaluation in a session with her consultants as a preparation for a workshop for FDP schools (Lenoir, 1977, p. 38).

Conducting a diagnosis systematically does not guarantee that the information obtained will be put to use. To improve its diagnosis of the existing situation and its delineation of possible targets, one group surveyed participants and fed back the results of the survey to them. Unfortunately, as Lenoir (1977) reports:

> The first efforts at survey feedback met with some problems; . . . the steps . . . were not rigorously followed. . . . The session in which the data were shared with the coordinators was rather uncomfortable; . . . they protested the validity of the data and the methodology (p. 35).

That espisode illustrates how problems often develop within problems. To move along in solving a problem, the group gathered information from participants by survey. But the participants declared the information fed back to be untrustworthy. The participants then found themselves faced by a new problem: how to get information about the first problem that they would accept as trustworthy.

If information collected by insiders was sometimes rejected, information collected by outsiders fared worse. It was often ignored:

> East Town High School was one of the places where . . . evaluations were . . . requirements of the funding agency. According to a long-time teacher, . . . the results of the evaluations were never used by the school for the planning of activities or change in the educational program (Lenoir, 1977, p. 38).
>
> The ICC employed an external evaluator to report on the activities of the school. . . . Apparently, neither the school nor the ICC utilized the results of the study in the planning of activities in the school or the strategy of the ICC (Lenoir, 1977, p. 38).

Help from consultants. Most of the evidences of systematic diagnosis recorded on the field data forms were taken from occasions when consultants were present. In all the funded sites of DTA, consultants took pains to illustrate in their own behavior how systematic diagnosis could be done. Here are three examples:

> One consultant asked another what could be learned from the survey. The other commented, "The model is inadequate in several areas: (a) orientation and entry, (b) it didn't specify the

> role of the principal and assistant principal, (c) it did not adequately tie into existing structure of a school, (d) methodology of participative planning proved to be tedious and frustrating (it almost sank the project), and (e) people didn't know where the project was headed."

> In the teachers' lounge, there was a large poster on the wall describing the consultant's evaluation. It said that because of the time press, anyone who wished should write something on the poster. Two people had written very general and very positive statements about the consultant's work.

> The consultant asks parent GG to share with the group the effort by parents there to document the school. Parent GG and two other parents present materials they have prepared. Parent GG said, "We started to do it because this September there was so much focus on the negative. We felt we had to put down our achievement somewhere so that we and others could see it."

Meetings. A great deal of the work of any change project in schools is done in meetings. Where we have seen ineffective meetings, we have seen ineffective change projects. Because meetings are so important, we looked for any hint in DTA's data that members of schools were diagnosing the conditions in their meetings--for descriptions by participants of the ways they handled their meetings and for descriptions, however oblique or laconic, of the ways they would like to handle them. Nowhere in Site Researchers' reports did we find any instance of participants paying conscious attention to the processes used in meetings unless consultants were there to prod them. Below are two examples of consultants demonstrating how to discuss the conduct of meetings. In these two examples, the consultants demonstrate debriefing. But despite these and many other instances of modelling by consultants in several of DTA's sites, Site Researchers recorded no instance of diagnosing processes in meetings when consultants were not present.

> The consultant recommended that feedback be as descriptive as possible as opposed to evaluative. He expressed pleasure with the group process in the two groups the prior day. He explained that there were two ways to deal with the feedback: (1) be defensive about oneself and the school, (2) take it as a description and go on from there. He also asked participants to present their own perceptions of the previous day's feedback activity.
>
> At 4:45 p.m., the group debriefed the day's activities. The consultant asked participants to state what they found effective and ineffective. One participant stated, "The colloquium was beautifully planned and structured." Another looked at his watch and stated, "I didn't even realize the time."

Granting the fact that the evidences of diagnosis from the DTA project were taken from only some of the sites and from only some of the months during which the projects at the sites lasted, the picture the evidences gave us included the following features. The greater part of the diagnosis occurred in informal conversations. Some systematic diagnosis occurred, especially when the local consultants helped. Local participants sometimes ignored the systematic diagnoses. Finally, though local consultants often demonstrated how diagnoses of the conduct of meetings could be done, we found no evidence that local participants diagnosed their own processes in meetings when consultants were not present. In sum, though local participants seemed to be capable of systematic diagnosis when consultants helped, it seemed very difficult for them to institutionalize regular processes of systematic diagnosis.

Searching for Information and Other Resources

By searching for information and other resources, we mean initiating searches from within or from outside school or group whenever the present information or other resources seem inadequate to plan an effective solution to a problem. A mundane example occurs not rarely in a problem-solving group that plans a solution requiring money to buy certain materials, An uncertainty then arises whether the principal has the necessary money or can get it, and then whether the principal will be willing to allocate it for the group's purpose. It is not rare that a group will spend considerable time simply wondering aloud. Some members will say, "I think she will give us the money," more on the basis of hope than on the basis of any evidence for thinking so. Some will urge going ahead with the plans on the supposition that the principal will give the money, despite the lack of any information to support the supposition. Some will recommend giving up the project on the supposition that the principal will not give the money, despite the lack of any information to support the supposition. Some, at last, will urge asking the principal whether she can disburse money for the materials.

Those varieties of response to uncertainty are common in group meetings at all levels of schools and districts (and in other kinds of organizations, for that matter). A group skillful in dealing with problems will assess the degree to which later action depends on resolving an uncertainty. ("Do we need to know what might happen at that juncture?") If the possible answers to an uncertainty will have little effect on further action, the skillful group drops the discussion. If the answers to the uncertainty can make a difference, the skillful group decides when the uncertainty must be resolved, how to get information to resolve it, and who will take the necessary steps. Those are the components of searching out information and resources.

Skill in getting information and other resources is obviously important to solving problems. A solution to a problem can founder if it turns out that participants have less than they need of information, status, affection, services, materials, or money. After our discussion in Chapter 3 of the affiliation (affection) motive and the function of the group as a haven from threat, we hope the reader will not find it strange that we include affection as one of the resources needed in the work of the school. Indeed, after reviewing the large body of empirical research showing the strong influence of affection on many kinds of behavior, Foa, Megonigal, and Greipp (1976) report an experiment in which a "warm" teacher produced greater learning of subject matter among sixth graders than a "cold" teacher and another in which returning money with affection erased feelings of aggression that remained when money was returned without affection. Affection facilitated the transmission of the other two kinds of resource. If we interpret "coldness" as more threatening than "warmth," the results of Foa, Megonigal, and Greipp fit with Hart's (1975) description of the functioning of the limbic system that we reviewed in Chapter 3. If work in schools is done cooperatively (collaboratively) instead of competitively, trust rises, affection rises, and the school can reap the benefits described by Foa, Megonigal, and Greipp and by Hart, among others.

Check List

Again, we use questions in a check list to suggest the kinds of inquiries a meta-skill in getting resources might prompt problem solvers to undertake. If the problem solvers judged a particular inquiry worth making, they would go ahead and search out the information or other resource.

Conceiving problems. Conceptions of problems begin in the heads of individuals, who then offer them to the problem-solving group. The following question refers to individuals' conceptions of problems.

1. Is realistic information getting to people in the ordinary course of events so that their first conceptions of problems match reasonably well with the real world? To conceive realistic problems, do people need more information about what is happening in the environment? in the school?

Vicious circle

2. To anticipate demands and overloads, do people need more information from the central office? from the principal? Do they need more information about new requirements of law? about changes in population? about community discontent with the school? about plans for desegregation? about the functioning of the school? about pessimism and optimism in the school?

See also question 3 below.

Environment

3. Are channels adequate that convey resources to and from the environment? Do some need to flow more readily? Should some be more closed? Is school or subsystem reaching sources of the requisite kinds of information, skills, materials, money, and so on, and reaching them in reasonable time? Is school or subsystem reaching the central office, parents, city government, federal government, research sources, consultants?

See also questions 1 and 2 above.

Images

4. Does school or subsystem draw out the different conceptions of school and environment held by different individuals? Are the ideas of people with unusual perceptions getting serious attention, or are they getting suppressed? Do unusual ideas get a hearing?

Images of images

5. Are problem-solving groups putting to use the resources held by individuals in the group--information, positions of status or authority that could be used persuasively, affection and friendly support, skills at doing certain parts of the task, materials or access to materials, access to money?

6. Where in school or subsystem is intake of information or other resources being inhibited by feelings of threat and feelings of wanting to "close the boundary"?

See also question 3 above.

Interpersonal relations

7. Do resources seem equitably exchanged in the school? Do people feel that engaging in problem solving will leave them richer or poorer in resources? Do people in a problem-solving group exchange resources in a way that makes them all feel stronger--information, status (respect, responsibility, authority), affection, services (skills, expertness), goods (materials, equipment), money?

Groups

8. Do people know who in the school or outside is skillful at one or another kind of third-party helping? Is third-party helping used at meetings?

School

9. Does the school have a way of acting as a resource-getting agent for individuals and subsystems within the school (versus letting every individual do it for himself or herself)? An obvious example is the library. Another is the principal's office when it relays information from the central office. Another is the janitorial staff when it brings in materials like towels, floor polish, etc. Does the school have ways of acting as agent to bring in other kinds of resources?

Places and Methods

Information and other resources can be sought and brought to bear by any level of the system: by individuals, groups, or the school-as-a-whole. An individual seeks information to do a job or to heighten satisfaction. Examples: (1) principals attend a workshop on budgeting procedures and return to their separate schools to use what they learn, (2) teachers who learn new ways of teaching spelling in summer school try them out in their classroom the next year, and (3) students learn about a game by watching other students play it. An example of seeking that mixture of status, affection, and services that we call social support occurs when (4) a principal calls together her department heads to make sure they will back her up in a proposal she is about to make to the central office.

Groups can seek resources; for example, a teaching team, a parental advisory group, or a student council. We speak of the group seeking resources even if the group delegates the seeking to an individual, because the individual gets the information for the group and the group does something with it. Examples: (1) a parent advisory group develops a school guidebook for community volunteers based on examples of guidebooks obtained from other schools, (2) one teaching team borrows a scheduling procedure from another team in the school, (3) a group of curriculum specialists in the district office finds out about peer-tutoring projects in other parts of the country, and (4) a curriculum committee asks the central office for money for materials.

Schools also exchange resources with other systems and subsystems. Example: A faculty begins the practice of visiting homes (instead of calling conferences in the school) after hearing about successful examples of the practice in other schools. In that example, the staff first got information from other schools. Members then gave status to parents by going to their homes, and there they gave information to the parents about their children's lives at school. Perhaps they promised services, such as giving special help to a child in mathematics. In return, the teachers received information from the parents and perhaps services such as urging a child to do his homework. Another example: The practice of using the services of parents as volunteer instructional aides spreads from school to school in a district.

There seem to be three ways that a school can reach out for information or other resources. First, members can take a currently uncommited or under-used resource and put it to use. Examples of this mode occur when a parent starts coming to the school to listen to students practice their reading, when the administrative team holds meetings at times when students are free to answer the offices' telephones, and when the school changes to some kind of year-round schedule to make better use of its facilities. Second, it is possible to use an existing resource in the school in a different way, as when teachers in the English Department put all their materials in a common room and create a resource for students in the school. Third, it is possible to bring in a resource from outside the school, as when a teacher and parent attend a conference together on the prevention of child-abuse and make a joint presentation at the school, or when a faculty starts to use team-building consultants during meetings, or when a principal seeks political support from a district's administration.

The resource of information can serve two primary functions. First, information can serve to build awareness of what it is possible for a school to accomplish. It can help in conceiving problems, that is, by expanding the range of alternative targets from which the school can choose. One of the schools in the DTA project, for example, began with the rather vague target of "involving parents to upgrade the instructional program." As consultants to the school, we offered short written descriptions on topics such as "How to Develop and Effective Neighborhood School Board" and "How to Help Parents Become Tutors of Students." We also presented a large picture gallery showing a variety of ways parents and teachers can pull together to improve the instructional program. We developed and used a slide-show at several meetings of the faculty and of the parent-teacher organization to depict alternative levels of parent-teacher involvement and potential benefits and debits of each. The handouts, picture gallery, and slide-show were presented to members of the school planning team (made up of teachers and parents), to the principal, to occasional meetings of the entire staff, and to a large meeting of parents and teachers. Those consciousness-raising activities were aimed at expanding the repertoire of specific targets the school might adopt. The spirit of the offerings was, "Different types of parent-teacher cooperation are possible. Different activities for parent-teacher cooperation actually exist in a variety of schools. What might be possible for us at our school, given our particular context?"

Second, information can be obtained for use in the problem-processing itself. For this second kind of function, information is sought after participants have specified their targets in concrete, realistic terms and are searching for the most effective steps through which to reach the targets. This second use of information requires it to be specific and often more technical than the information used for consciousness-raising.

In a district of the DTA in which we consulted, after raising the consciouness of some principals and instructional assistant principals about the importance of their becoming management teams to solve problems together in their schools, we offered a diagnostic questionnaire to help the principals and their assistants establish plans for creating management teams that could solve problems concerning instructional issues. The questionnaire, entitled "Diagnosing Our Team's Effectiveness in Problem Solving," was used to kick off a 15-hour team-building workshop.

Where Schools Are Now

As we did when studying systematic diagnosis in schools, we went to DTA's data to find out how the schools in the funded sites were getting information and other resources. Here is what we discovered.

Traditional suppliers. The schools often went to the traditional suppliers for information or materials. Here is one example:

> The teacher distributed work packets to participants. The materials included the programmed reading series (Allyn and Bacon, 1971) consisting of Teachers' Manual, a duplicating master, and ten reading books. He discussed the usefulness of the materials.

Visits to other schools. Teachers and parents were almost always eager to visit other schools to pick up ideas they might use back home. They often found the trips highly motivating:

> The president of the Neighborhood School Board asked the people who had visited the REP project and the St. Paul school to report on their trip. Those who had gone to NYC said they had learned a lot and had information for a curriculum workshop. They said they had the people and materials needed and had also learned a lot about organization. Those who went to St. Paul said they saw much they could use and were impressed with the degree of parent participation and the children working independently. They were delighted with the janitor's participation, the use of senior citizens, and the children's workshop.

Transforming information. Translating or transforming information into a form useful locally was a recurrent necessity. As many other studies of change have reported (see Appendix A), DTA's Site Researchers reported that training and modelling were especially effective ways of transforming information for use by local people. From the REP project, Lenoir (1977) reports:

> Because in many cases the consultant was a fellow teacher, modelling was a particularly effective technique. Teachers in the Learning Community turned to and observed the activities of the experienced Assister, who was functioning as a master teacher in matters concerning curriculum, classroom organization, and child development (p. 42).

Lenoir (1977) quotes Karunakaran's description of the highly experiental training given to parents in the same project:

> . . . parents . . . have spoken of the fact that they were given Cuisenaire workshops to understand the new math being taught in the open classrooms. Parents were invited to join teachers in reorganizing classrooms. Parents were invited to contribute "found" materials for use in their children's classrooms. In each of those activities, the pedagogical rationale was explained to parents, mainly in terms of children's growth and development. Thus the [REP] familiarized parents with the nits and grits of the Learning Community Program so that they could talk about it knowledgeably to other parents (p. 42).

To maintain norms and skills for change after the departure of consultants, the CBEC project deliberately left behind in each school an embodiment of the procedures for change they taught. Lenoir (1977) says:

> [CBEC created] the role of an internal change agent, the Improvement Coordinator. . . . some functions of the role are . . . (1) The internal agent was the initiator and coordinator for planning the . . . assessment of school problems. (2) The internal agent was the problem solver and negotiator for the implementation of teacher-originated curriculum projects . . . (3) The internal agent was the leader of a sub-structure in the school devoted to developing school-wide plans for change. (4) The internal agent was a catalyst for involving other departments . . . (5) The internal agent was an example that efforts to promote systematic planning in the school could have success (p. 60).

Transforming ideas about how-to-do-it through example was not always easy. Speaking of efforts to bring parents into active influence upon the management of the school in the NCEI and IEC projects, Hyde (1977) writes:

> In addition to personal knowledge of the school, parents required technical knowledge of educational practice. Dialogue with professionals was the beginning of knowledge acquisition; sharing perceptions, values, and beliefs is important. However, professionals easily dominated, perhaps unwittingly, particularly in areas of curriculum and budget. Special experiences or training were needed for parents not to defer to the professionals; that was especially true for poorer parents. The Executive Committee of NCIE did not want complete budget reports, only summaries. Parents [in the IEC project] questioned

> their ability or right to assess teachers when given the power to hire, evaluate, and fire professionals (p. 73).*

Independence from consultants. In the earlier section on diagnosis, we noted that school staff and parents in the DTA project used a good deal of help from their consultants to carry out systematic diagnoses of their schools, and that they conducted no diagnosis at all of their processes in meetings when consultants were not present. In contrast, we found about half a hundred examples of school staff and parents obtaining resources from outside the school without the aid of consultants. Compared to suburban and smaller-city schools with which we have had experience, the local people in the urban sites funded by NIE showed a great deal of skill in obtaining money and political support.

> A teacher and a parent discussed contacts with news media. They said that they had not yet been able to contact "Black Is," a TV show, but would keep trying. The teacher said that another parent had received time to talk against the closing of the school on the "Wrap It Up" program on channel 32.
>
> The principal said that the neighborhood newspaper was going to publish articles in favor of keeping the school open. However, articles would not appear until after the board voted. He said he was brainstorming with a group of resource people, over the weekend, about what could be done to influence the board. He said copies of our better letters should be sent to the mayor, governor, and commissioner of HEW.

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* Stavrianos (1976, pp. 69-70) tells of the similar difficulty when workers were given control of industries in Yugoslavia. Schools are unique, but they are not radically different from other human organizations.

School people sometimes showed remarkable originality, energy, and courage in reaching out for political support. Lenoir (1977, p. 86) quotes an example from Brown that occurred in the WNSB project:

> There was discussion about the [possibility] that adverse reaction from Fishtown groups could ruin everything by scaring off the Mayor and Governor. It was proposed that a confidential meeting be set up with leaders, particularly those who have been critical of us in the past. "This is one time we need to really trust our enemies," Winter said. The group voted 100% in favor of the motion for Jane Fox to set up such a meeting as quickly as possible.

Political support was often crucial. Lenoir (1977, p. 57) reports, for example,

> NCIE's . . . connection with a group of community elites served it well during the beginning of the school, but failure to establish connections with the indigenous political groups of the East Town community was a serious miscalculation in the broadening of its political base for future survival.

Transmitting visions to newcomers. One of the vital resources of a school is the new people it takes in--students, staff, or parents. When a school is operating in a non-traditional way, as was the case of many of the schools in the DTA project, one of the crucial problems is how to transform the experience of the old-timers into information that will enable the newcomers to share with the old-timers a common image of the school. If it is difficult for the first change agents to transmit their image of a changed school to the first participants in the change, it is even more difficult for the first participants to transmit the image to the next generation of participants. At first blush, it might seem easier to do so, because the school in its new way of working is there for the newcomers to see. But every human makes his or her own unique image of experience, and every human uses past images to put meaning on new experience. The old-timers see meanings in the way the school functions that the newcomers do not see. The two groups make different diagnoses:

> Teacher Garfinkel is talking to a group containing an adviser to the local project, the newly appointed bilingual parent-facilitator for Arcadia School, and DTA's Site Researcher. Garfinkel explains that there is an increasing trend among parents at Arcadia School to discard open-education philosophy. On being asked what she means, Garfinkel explains that new parents, having little sense of the long and slow process by which open education has come to be established at the school, are disappointed by some classrooms and by some teachers with whom they find their children placed. [Site Researcher's comment: There are teachers in open-education schools who have recently been transferred there from non-open schools. Few teachers have a sound understanding of open-education philosophy or strategy. Only a handful of teacher-training colleges provide that kind of training.]

Much simpler ideas than open education are difficult to explain in words, even when the words are accompanied by direct demonstration. It would seem not too difficult, for example, to explain the role of facilitator in educational change, and it would certainly seem easy to tell people the length of time a change project will require. Holmes (1977), however, tells us about the difficulty of conveying understanding about those two matters.

Holmes describes the work of DTA's Chicago Technical Assistance team in an elementary school. As one part of their work there, the Chicago team conducted six workshops to convey information and skill concerning the manner of teaching in the style of open education developed by REP in New York. The workshops included direct instruction, conferences and problem solving by participants, and discussions with visitors, including discussions with a Teacher Assister from REP. Even after many weeks of modelling the facilitator role by DTA's Technical Assistance team, however, much confusion about it remained in the minds of participants. Among other specific questions raised at the fifth workshop, Holmes (p. 106) reports, "Some teachers said they did not understand what 'facilitation' meant." DTA's Eugene Technical Assistance team has had similar experiences.

Time estimates, too, are difficult for people beginning a change project to understand. One of the schools in DTA was seriously considering adopting a style of open education that had been successful at another site for some years. One might think one or two workshops portraying the complexities of teaching in the style of open education would be sufficient to persuade participants that developing the new interpersonal and organizational norms would take a long time. Yet a teacher quoted by Holmes (p. 109) made this remark after the sixth workshop:

> Talking to [visitors from REP] made us realistic. I can see it'll probably take us five years.

The examples above show that conveying new information, skill, or support of other kinds to schools, if the schools are to make good use of it in dealing with complex problems, is far from a simple matter of "delivering a package" to a passive recipient.* School people are busy, sometimes frantically busy, coping with their myriad difficulties. If they are to make use of help from outside, someone must adapt the information, skill-training, or other support so that it comes in the right form to the right people in the right place at the right time. Few people in schools or school districts have the right combinations of skill to do that, and in many places even fewer have the time.

In summary, the DTA schools, like schools everywhere, often went to traditional suppliers such as textbook publishers for information and materials, and members often visited other schools to garner good ideas. They almost always found it necessary to transform information for their use locally, but they often found that to be difficult, especially when the concepts were subtle or when people with experience in a change project were trying to convey a vision to newcomers. The project in open education and the projects using methods of organizational development had special difficulty in transforming information to convey images of the target and the steps in change to newcomers. Even the length of time a change would require was difficult to convey.

Mobilizing Synergistic Action

Even if a school were to exhibit well developed norms, structures, and procedures for systematic diagnosis and for getting information and resources from inside and outside, we would still not predict it to show an exemplary capacity for solving problems. Even when an accurate diagnosis of the present situation has been agreed upon by all concerned, when a clear and specific target has been consensually chosen, and when people have declared their commitment to realistic and well understood steps of action, even then a crucial step remains. Someone must actually take the first, risky, irretrievable action in the new mode. That first step into action is usually a very big one for participants in change. We have seen many groups able to do excellent planning but unable to act on the plans.

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*See Appendix A for strategies of consultants in aiding knowledge utilization.

We emphasize the necessity for synergistic group action in organizational change, because new norms and role-relationships are more than the sum of individual actions. Administrators and others too often try to bring about an organizational change by instructing every individual what to do and then saying, in effect, "On next Monday morning, do things the new way, not the old way." As everyone except top administrators seems to know, that method rarely accomplishes much.

During organizational change, norms, procedures, and job descriptions are necessarily in flux. If a solution to a problem requires changes in norms and role-relationships, then temporary subsystems must be mobilized capable of acting outside, despite, or even against established routines, regulations, and customs. Serious change requires closely coordinated groups of people who can quickly build their own special procedures and norms that can carry the school or district through a period of change into a new stability.

If change is to proceed to a new pattern of stability, members must be in frequent communication up, down, and laterally to keep up with every latest development. Collaboration must replace isolation and hierarchical direction so that commitment to new action can be accurately ascertained and adequately supported. With intimate collaboration in processing problems and making decisions, new patterns of coordinated action can take form that cannot possibly be brought into being by directives to separate individuals.

A strongly cohesive group in which members share understandings of their purposes, norms, skill, and resources, in which those understandings are both explicit and intuitive, and in which every member confidently expects other members to act so as to support his or her own acts--such a group can achieve results that cannot be achieved by individuals directed from above. So far as we know, no basketball coach has ever expected to win a game by sending a memorandum of instructions to each player, ending with, "Go out there Monday morning and do it."

Check List

Since the places for action in the system are fewer than the places for conceiving problems or searching out resources, our list will have fewer categories than the lists in the previous two sections.

Vicious circle

1. Do people with energy and optimism seek out others with energy and optimism with whom to solve problems?

2. Do people collaborate to reduce the overload (if there is one) of demands, innovations, and the like from inside and outside the school?

See also question 3 below.

Environment

3. Do people collaborate to anticipate demands (input) from the environment? To solve problems of influencing (output) the environment? Or are those matters left to individuals?

See also question 2 above.

Interpersonal relations

4. When working together, do people express heightened feelings of satisfaction with achievement, affection, and power?

Groups

5. An effective problem-solving group decides in a reasonable length of time either (1) that a feasible plan does not seem likely to be achieved, and therefore further problem solving will be postponed until a more auspicious time, or (2) a feasible plan has been achieved in reasonable detail, and therefore action will now be taken. Do work groups in the school show the ability to agree on when it is time to make the one decision or the other?

6. To help them take action, do problem-solving groups draw out relevant resources from its own members and draw in relevant resources from outside?

7. When a group takes action, do members check on whether schedules and sub-goals are met and feed back that information to the group? Does the group then alter plans and schedules appropriately?

School

8. When a group takes action, does the school as a whole aid the action or get in the way of it? Do interfaces do their part? Do administrators and other individuals? Do people in the school feed back information to the group about how well the problem-solution is working?

9. When the action of a group (or the school as a whole) is intended to institutionalize a new way of doing things, do the affected parts of the school move sure-footedly to do their parts? Does the school circulate news at the appropriate point that the new way of doing things has been achieved? or if it fails, does the school circulate the news that the effort is being given up?

Places and Methods

Individuals can stimulate others to synergistic action. That ability is often called charisma. We like Berlew's (1974, p. 267) conception. He says that leaders become charismatic and "generate organizational excitement" when they

> develop a "common vision" for the organization related to values shared by the organization's members,
>
> make the organization's members feel stronger and more in control of their own destinies, individually and collectively, and
>
> discover or create value-related opportunities and activities for individuals within the framework of the mission and goals of the organization.

Berlew recognizes the power of envisioning a better future state (target) and the necessity of finding commonalities ("common vision") among the individuals' images if action is to be concerted and vigorous. He sees the energy that can be released by satisfying individuals' need for power in pursuing their own work--"make members feel in control of their own destinies." Berlew then says that common vision and individual motivation can yield action if the leader creates "value-related opportunities" for action "within the mission and goals of the organization." In brief, the charismatic leader finds an image of what-might-be that is valued by many members, creates opportunities for action that will move toward that image and at the same time further the mission of the organization, and gives a large measure of control over the actions to the workers themselves. In the terms we use to describe problems, Berlew is saying that action toward a target--that is, problem solving--will go best if a target is chosen that fits not only the school but also the aspirations of its members, and if each member is then encouraged to carry out his or her part of the work in the way that suits him or her best.

Hyde (1977) distinguishes principals with "visions" from others in the funded sites studied by DTA. Visions, Hyde says, guide problem-processing when

> . . . the principal and others in the school have an important sense of where the school "ought to be." Their conception of the ideal state of affairs powerfully motivates their perceptions of the current state and guides their action (p. 27).
>
> Clarity of vision [means] the certainty of one's direction, not the specification of destination. . . . visions [are] states that are considered to be of value for themselves, as opposed to being merely the opposite of a current unpleasant situation (p. 28).

Hyde finds vision powerful in moving people to deal with their problems:

> The first finding is that visions foster problem perception and problem-solving methods of particular efficacy (p. 32).

Like Berlew, Hyde finds an important component of visionary or charsimatic leadership to be that of granting workers control or power over their own work:

> A capacity for solving problems of developing curriculum and staff would [include] delegating responsibility and authority . . . . A capacity for solving problems of administering the school would [include] conceiving of the whole school's tasks and delegating to others and selecting for self-tasks according to people's talents. . . (p. 34).

Groups can inspire themselves to action in the same way a charismatic leader can. The group itself can take on the charismatic character. Indeed, the charismatic mode of functioning can be taught to a group. When members of a group can enunciate a common vision, when they can strengthen one another and help one another control their common destiny in a way that individuals prize, and when they can choose opportunities for action that fit their vision and their values, then that group can take action with alacrity, decisiveness, and vigor.

In groups capable of synergistic action--groups with charisma, if you will--individuals find deep satisfactions rare in ordinary life. Some of that flavor comes through in Brown's reports about members of the WNSB project, quoted by Hyde (1977, p. 48):

> I talk more; I found sisters and brothers on the board. I feel strong because I feel wanted and needed. I learned to disagree and not get mad. I got to know people and was able to voice my opinion. I know now that I'm not always right and when people vote against me, it was not because I'm colored--they just disagree with me. Staff is more friendly to me now.
>
> I used to be shy and backward--I wouldn't even try to make a decision. Since I've been chairman to the board, things

> have changed--now I do it and try not to worry about it. Some decisions are bad and that's my fault--others are okay. It (the board) has helped me a lot. Staff is much more friendly to me than ever before.
>
> I have really enjoyed it what times I've been on the board. People seem to treat me different--like I'm more important, you know. I've learned that I'm not always right. I think I'm learning how to get along with people better. I think it is fun.
>
> It (NSB) has meant a lot to me personally. I've enjoyed the workshops and hope we have more. I can explain things to my husband now; we talk things over and can communicate better. It was a turning point in my life.

A synergistic group is also characterized by very close coordination, which in turn requires an intimate knowledge by everyone of each person's capabilities and readinesses. Everyone knows what others can do alone, what they can do with help, and what they might learn how to do. That kind of understanding requires time to develop. If turnover of personnel is rapid, the group has no chance to develop that intimate kind of morale. In his study of nine principals at DTA sites, Hyde tells of the terrible disruptions of staff with which many of the princpals had to deal:

> . . . none of the principals exhibited successful solving of problems of teacher morale (p. 122).
>
> Six of the nine schools in this study were located in New York, where teachers were laid off and transferred at astonishing rates in 1975 and 1976 (p. 124).
>
> The massive teacher turnover in New York schools resulted in East Town High School losing half its staff on three occasions (p. 127).

Where Schools Are Now

The data from DTA's funded sites of course demonstrated many actions taken by members of schools in the project. It was almost impossible, however, to pick out clear examples of synergistic action taken as part of a conscious solution to a problem. First, it was usually difficult to tell whether an action in a particular school was part of a planned solution to an organizational problem--part of a plan to reach a target agreed upon by school or subsystem. Here is an example:

> The students become involved in . . . the writing of scripts and the use of sound in developing the production. The teacher explained that students work together in groups and share responsibilities for tasks according to their individual interest and expertise.

Was the sound movie being made by the students one of a series of actions taken to alleviate a problem chosen by school or subsystem? Or was it simply a project the individual teacher and her students developed to fit the objectives of a course, without any reference to a problem in the school that needed reducing? We are not concerned, in this document, with an individual's problems solved by an individual, nor with problems solved within a classroom without reference to other parts of the school. We are concerned with the ability of a school and its subsystems to reduce problems that require new norms and role-relationships. We are examining the capacity of the school to solve problems, not the ability of an individual to do so.

Second, it was usually difficult to tell, when work in groups, was reported, whether the work was collaborative and synergistic, or whether the group was simply used as a mechanism through which to split up a large task and assign parts of it to individuals working separately. The second sentence in the example about the sound movie illustrates that ambiguity.

Below is an example of action by parents and teachers. We know from other records of DTA that this action was a deliberate part of a plan to increase the amount of influence from parents upon the school. But we cannot show clear evidence from the record that the Neighborhood School Board carried out the action in a synergistic way--in a way that accomplished a result greater than could have been achieved by separate individuals performing separate, uncoordinated tasks:

> The principal then proposed to appoint, from within the Neighborhood School Board, a task force on classified personnel to be responsible for screening and hiring paraprofessionals. He said that the president of the Neighborhood School Board had contacted all 23 paraprofessionals from last year and all wanted to return this year, though only 14 positions are open.

DTA's records contain many descriptions of actions in the schools that almost any reader would admire--actions that provided good learning opportunities for students, collaborative actions among staff that led to results they wanted, and so on. But in any particular instance, it was almost always impossible to tell whether the action was a part of conscious problem solving, or synergistic, or both.

We are sure that a good many things did happen in the schools of the DTA that had the character we have described as synergistic action in problem solving. Reading the case studies produced by DTA leaves one convinced. The REP project, as an excellent example, exhibited a great deal of synergy in the collaboration of teachers, parents, and students (see

Karunakaran, 1977). Learning opportunities for students were produced that could never have been produced by teachers connected only atomistically in the manner of the traditional egg-crate school. But that conviction comes through from the discursive account in the case study. No single paragraph on the field data forms provides convincing evidence.

Below is the one paragraph from the field data forms that does seem to us to exhibit synergy clearly and to be a part of action toward a clearly agreed-upon target:

> Half an hour earlier, about 20 parents walked into the principal's office. The principal was previously apprised of the parents' decision, and he is in support of their action. The parents are staging this sit-in (and possibly sleep-in) as a protest against the shortened school day, which is being boycotted by several other schools in the district. In the hallway facing the main entrance into school are a number of posters, announcements, and photographic displays concerning the present crisis. A cutting from a local newpaper shows a collection of photographs under the caption "West side parents protest the shortened school day." Parents of this school and others, are shown marching, carrying banners protesting the cuts in the school day. There is a picture of [Person X] with the caption "WANTED: [Person X]--but not here." Just outside the school office, a sign says, "We have had a very rough week. The staff has been beautiful. Thank you. Signed, the parents of PS ____."

In summary, it was very difficult to be sure from the observations written on field data forms by the Site Researchers when we had evidence of synergistic action and when we did not. Several of the case studies convince us that synergistic action occurred in some schools at least occasionally, and in a few schools frequently. In at least one school, synergistic action occurred among the staff almost every day over several years. All in all, however, the evidence of synergistic action seems to us scarcer than evidence of diagnosis or resource gathering. That does not surprise us. Action is the step of irreversible commitment. It is scary. It requires a great deal more social support than the activities of diagnosis or resource gathering.

Monitoring the First Three Meta-Skills

Monitoring the first three meta-skills is the crowning skill necessary to sustaining a capacity for solving problems in the school. It is the skill of being able to observe one's own group and ask, "Are we as skillful as we need to be in diagnosing our functioning, getting appropriate information and resources, and mobilizing our action synergistically? Are we able to move ourselves in the directions we want to go?" Answering those questions gives the group or school an awareness of its capacity to deal with problems productively.

When a group or school is aware of its problem-processing capacity, it does not examine its meta-skills in a vacuum. It examines them in the context of the content-problems it has been trying to alleviate. It will be able to describe its own norms, structures, and procedures. It will examine goals, plans, and actions and question their relevance. It will display upshifting: it will ask not merely whether it is achieving its goals; it will also ask whether the goals are worth achieving.

A mature meta-skill is of course institutionalized. It is maintained through norms, structures, and procedures. A school that wishes to sustain a lively capacity for solving problems will review its meta-skills periodically. It will assign that duty to a particular subsystem to be sure it gets done, but of course it will welcome assessments from any individual at any time.

The items in the check-list for monitoring the other three meta-skills are simply those three skills. To check on how well they are being exercised, one would ask whether the school is doing the things we asked questions about in the earlier check lists.

Where Schools Are Now

As might be supposed, we found only rare examples of a group or school examining the skills it applied to problem solving. The local consultants could almost always describe rather clearly the methods and skills they thought necessary to successful problem solving, but the local participants could do so only rarely. From DTA's data, we can offer only descriptions of the difficulties participants had in articulating what they were doing. Apparently, their images of their actions were usually vague and fragmentary.*

In the illustrations below, participants and Site Researchers do not use our terms of diagnosis, searching for resources, and synergistic action. The yearning for clear images, however, comes through clearly: the yearning to be able to put into words some systematic description of problem solving, along with the key methods and skills necessary to it.

> In discussing the summary report, the consultant stated that very few persons interviewed saw renewal as a problem-solving process besides the coordinator and the principal. He stated that the majority of persons interviewed saw renewal as an opportunity for creating innovative projects.

---

* For further discussion of the vital function of images of action in dealing with problems, see Lenoir (1977, pp. 39-46) and Wilson (1977). Lenoir writes of "cearly communicable action strategies" and Wilson of "shared cognitive frameworks."

> Participants involved in renewal stated they had no idea of what self-renewal was or the OD process. It became a replication of other innovative programs. The methodology was not clear, and areas of responsibility were not clear. The consultant summarized: . . . (3) technical training missing, (4) implementation process fuzzy.
>
> JC, past president of PTA, suggests that experienced teachers provide parents with the rationale for their methods in open education classrooms. A majority of parents agree. A decision is taken to arrange such a meeting.
>
> The principal of the prospective renewal school specifically asked for more of a conceptual, theoretical model presented as it could be put into practice.
>
> Parent KG asks if open education has a "marketable statement" about itself. She says growth companies, in a report she had read, feel the necessity to have statements about themselves. JI, in an aside, "This woman is peculiar."
>
> JC asks GG whether she notices a great deal of difference between the older parents and the new parents. GG says emphatically, "That was the reason that we began our documentation." She says parents who were new to the school would come in and say, "You call this open ed?" She adds, "We had experienced six years of gradual changes. That's when we felt we needed to document the excruciating growing pains we underwent. We wanted to show not only other newer parents, but ourselves, what progress we had made." EK says, "Well, the other half of that is that parents who have just come in can never know what it was like. So that's a problem you cannot solve."

Our overall impression is that few participants had a technical language in which to talk about their meta-skills, but they often talked in common language about their desire to conceptualize what they were doing and about their desire to know how well they might be able to meet the next problem that might arise. No place, however, did we find evidence of a clear, shared procedure for monitoring meta-skills.

Summary

We take the institutionalization of four meta-skills to be essential if a school is to sustain a capacity for dealing productively with its problems: (1) diagnosing its own organizational functioning, (2) searching for information or resources from within or from outside, (3) mobilizing synergistic action, and (4) monitoring the first three meta-skills.

We believe that those four skills are very low, or at least too low, in most schools of the nation. The norms of most schools fail to support the four meta-skills. Our examination of the data from the nine funded sites and from the further sites where DTA has conducted technical assistance leaves our belief intact.

In the data from the nine funded sites, we found that informal, conversational diagnosis was the most common kind. The conversations only rarely mentioned information available outside the group--either information previously recorded or information that might be systematically compiled. We did find some instances of systematic data-gathering through interviews or questionnaires. Those instances occurred more often in projects where coordination was most effective, as in the REP project.

Most projects were very active in searching out information that would facilitate the acquisition of further financial or political support; many were very vigourous, skillful, and successful in marshalling political support for their projects. Our experience, in general, is that urban schools are politically more skillful and aggressive than suburban schools.

Nevertheless, most instances of seeking financial or political resources occurred when a school was being threatened with a loss of those resources. Careful planning for maintaining financial or political resources over the long run was extremely rare.

We found some evidence of synergistic mobilization of action. The available records, however, showed fewer instances of synergistic action than instances of half-successful struggles to achieve it.

Finally, when we looked for consciousness or monitoring of the first three skills, or ability to verbalize the monitoring, we found clear evidence of that ability on the part of some consultants, but the occasional evidence of that kind of concern on the part of participants usually took the form of complaints that they were unable to verbalize well their skills and criteria for success.

Some of the schools in the funded sites, of course, were showing much higher levels of skill than others. Some schools have dropped out of the projects, but some projects have recruited further schools. The project managed by the Economic Development Council of New York is scouting schools in other cities. On the whole, the data give a picture of some signal successes, some hopeless failures, and much continued struggle.

We repeatedly encountered instances of the terrible impediments lying in the way of effective problem-processing in urban schools, a matter we discussed under the heading of the "vicious circle" in Chapter 2. One of the worst impediments to orderly change was the massive reassignment of teachers to other schools because of financial cuts, union rules, or desegregation.

Review and Preview

In the course of the two previous chapters and this one, we have described eight kinds of things we think it is very important for a school to take into account if it wishes to achieve a sustained capacity to solve problems: (1) the conception of a problem as a gap between a present condition and a target condition, (2) the vicious circle of overload and enervation, (3) the conception of humans as inherently active, creative, and unique in their images of the world about them, (4) the conception of the school as inherently multi-motivated, creative, and full of differing images of itself and the world about it, (5) the function of diagnosis of the school's present condition, (6) the function of resource gathering, (7) the mobilization of synergistic action, and (8) the monitoring of the last three activities.

We can think of each of those eight things as a cluster of variables--ways in which schools can differ from one another. We will do that in Chapter 5. We will list there not only the variables we have already discussed, but also a number of others that we believe to be important to solving problems in urban schools and to developing a sustained capacity to do so. The chapter will also set forth some phases we have frequently observed to occur in change projects.

Chapter 5

VARIABLES

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Chapter 5

VARIABLES

Later in this chapter, we will list variables we think have important effects on developing and maintaining a school's capacity for solving problems. But we need first to say a few things about the point of view from which we selected the variables.

Change and Stability

Solving a problem implies changing from one way of doing things to another. But you don't usually plan to change every feature of the way the school carries on its work. There is always a background of stability against which the change occurs. Nor do you usually plan to go on changing forever some particular way of doing things. You usually plan to give up one stable pattern and take on a new pattern, making that one stable in turn. Change and stability are yin and yang, two sides of the same coin.

There is another way that change and stability go together, a way that seems at first blush something of a paradox. When we talk about sustaining a strong capacity for solving problems, we are proposing a stable capacity for changing ways of doing things. With one breath, we describe the capable school as changing its way of doing things as often as the seriousness of a problem seems to demand it. With the next breath, we describe the school as maintaining almost a routine for conceiving problems, setting out to solve them, checking on progress, and examining the skills it is using as it goes along. The paradox, of course, is not really there. Having a customary manner of deciding whether to change--and if so, what and how--is merely another instance of upshifting (see Chapter 3).

A school maintains a high level of adaptive flexibility by flexing its adaptability. When a school skillful at solving problems chooses to convert a difficulty into a problem to be worked on, it does not leap to a habitual solution--such as asking the principal to do something about it, or writing a proposal for funds to the federal government, though either of those could be appropriate in a particular instance. Instead, it examines the uniqueness of the problem and looks for alternative targets and paths to targets that might best alleviate the unique problem. But despite the uniqueness of the problem, the school systematizes its work by using a problem-solving procedure such as the one we described in Chapter 3 and by applying the meta-skills we described in Chapter 4. Its members agree with one another, "Until we decide differently, here is the procedure we will use to deal with problems, whatever they may be like."

Humans will always create some sort of stability in the midst of change. Even in earlier eras when society was changing at a pace that seems snail-like to the modern mind, humans sought the "eternal verities." No meeting in which change is contemplated goes by without some member proposing some procedure with which to bring order and predictability out of confusion. The important thing is that a problem-solving group agree on procedures, sequences, techniques; it matters less what they are. We offer the stablizing skills that we do in this document--the problem-solving sequence and the mata-skills--not because they are the only techniques that will work, but because they help us to plan well and because we have found that school people in most situations can learn them rather rapidly and use them.

The urge to stability has it neurological underpinning. Our reptilian ancestors operated almost entirely by routines, and the reptilian parts of our own brains (see under "Interpersonal Relations of the Social Animal" in Chapter 3) still operate largely that way. We have a "need" to put "structure" on our experience; that is to say, we do it willy-nilly. A group becomes effectively coordinated when all its members use approximately the same structure.

The environment constantly bombards us with novelty. Much of the novelty has little effect on our survival or safety. Rain or shine, we can walk and talk in much the same way. But when, as too often happens in urban schools, the flood of novelty forces us to disrupt our normal routines of working with others, our neocortex is likely to cry out to our limbic system, "Quick! Make some order out of this chaos! My safety in my group is being threatened!" And the limbic system then pushes us into too-simple reactions, such as fighting an apparent enemy unthinkingly, running away physically or psychologically, or shrinking into automatic routines in the hope that the demand for change will go away. But when members of a school have common understandings of procedures for solving problems and of meta-skills, they can feel they know where they and their colleagues are putting their feet even while they change the paths upon which they walk.

In recapitulation, the school needs change and stability at the same time. It needs periods of rest between stressful change, and it needs supra-routines even during change. Administrators and other members of schools must deal both with change and with stability. During change, they must use methods that keep participants from feeling rudderless. When we list variables later on, we will be listing variables which, as they rise and fall, can affect processes of stability, change, or both.

Short and Long-Term Change

When people in a school feel frustrated by a particular condition and are impatient to do something about it, it is natural that they should want to focus their energies on that one difficulty, find a target to work toward, and reduce the problem as quickly as possible. With that attitude, people are likely to want to change as few variables as will lead quickly to a solution and to pay little or not attention to other variables that might be affected by what they do. They are also likely to want to pay little attention to variables that will be affected in the long term by their very action in reaching the target they have chosen. As we said, that short-term attitude is natural and understandable.

A school with a sustained capacity for solving problems, however, will take the long-term view. Changing some variables in a school always does have repercussions among other variables, sometimes slight and sometimes great. The capable school will think about the possibilities so as not to find that it has done away with a couple of cacophonous cats only to find itself overrun with mice. We will give a couple of hypothetical examples to illustrate what we mean by the short-term and long-term views.

For the first example, let us suppose that teachers in a school have become frustrated with the daily "misbehavior" of students. The students fling hurtful words at one another and at teachers. There are occasional fights. Students are ready to take advantage of one another in ways large and small, and rarely show cooperative and helpful behavior.

The teachers choose as their target a clearly noticeable increase in "students' socially constructive behavior" (see Figure 5-1). They agree that they will have to work closely together if they are to reach their target. They will have to work collaboratively so that whatever they do, the students will encounter that new behavior on the part of every teacher. One of the steps in the path to the target, then, will be to increase their own collaborative skill. They think it might be a good idea to hire in a consultant to help them learn new collaborative behavior rapidly. When they are actually collaborating with one another, they reason, one immediate effect will be that they will feel less anxious about the situation, because [illegible] have confidence in [illegible] one another's support for their [illegible] When they have improved their skills with one another, they believe [illegible] will be ready to try collaborative techniques with students in their classes. From that work in class, they expect two outcomes. One will

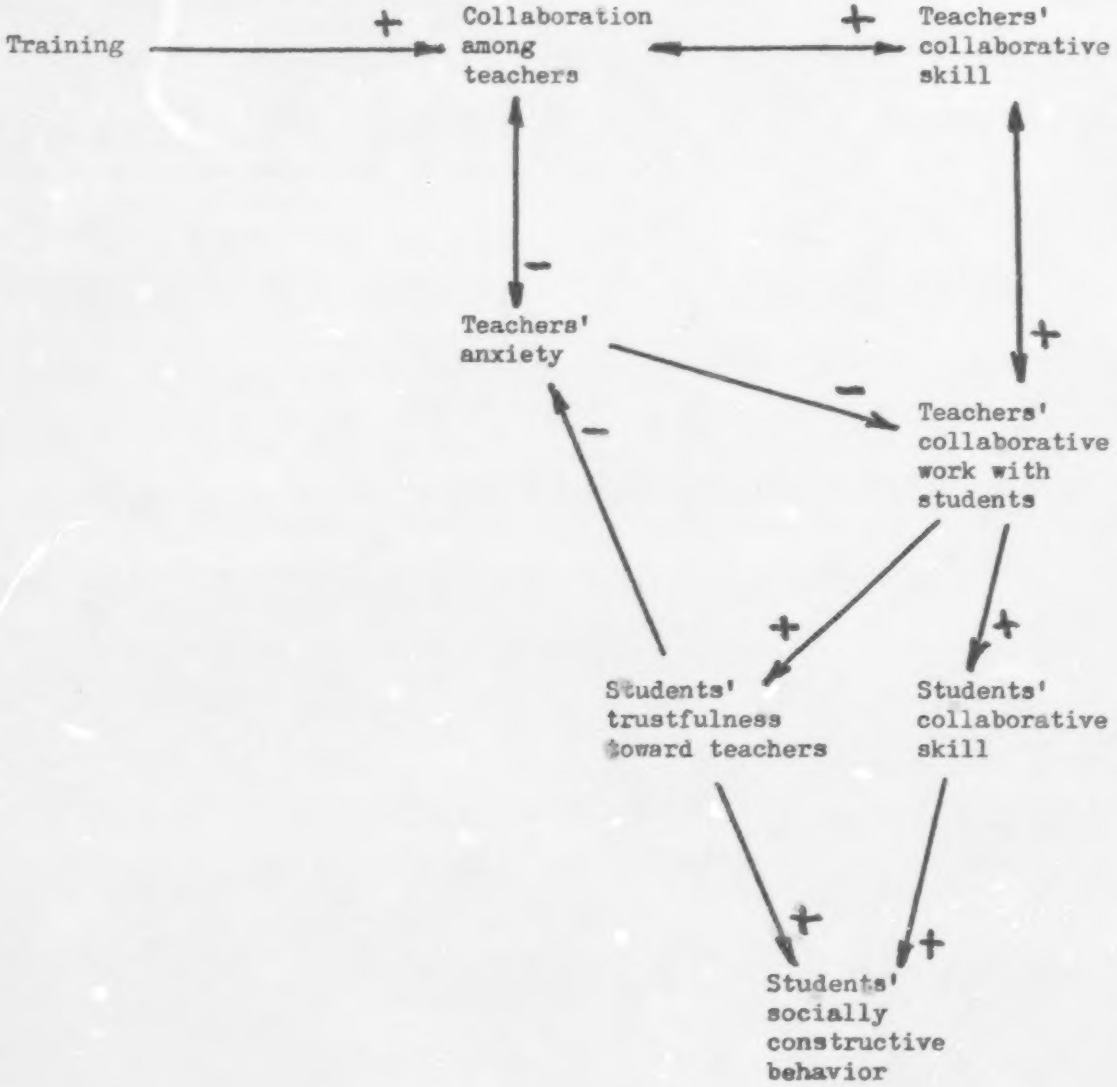
Training
+
Collaboration among teachers
+
Teachers' collaborative skill
−
Teachers' anxiety
+
−
Teachers' collaborative work with students
−
+
+
Students' trustfulness toward teachers
Students' collaborative skill
+
+
Students' socially constructive behavior

Figure 5-1. Examples of some variables and some causal hypotheses connecting them. Increasing the level of the variables (or decreasing, in the case of anxiety) might be taken as steps through which to solve the problem of increasing students' socially constructive behavior in the short term. An arrow with a plus sign on it means that if the variable at the tail of the arrow goes up, so will the variable at the head of the arrow. A minus sign means that if the one goes up, the other will go down. Two arrowheads mean that the causation works in both directions.

be that students will improve *their* collaborative skills. The other is that students will feel more trustful toward their teachers, because that is a usual outcome of collaborative work. Both those two outcomes should then enable the students, with the support of their teachers, to begin to try out socially constructive behavior among themselves and with their teachers.

That reasoning is diagrammed in Figure 5-1. The phrases in the diagram can also be thought of as steps toward the goal. One strong feature of the plan is that it contains a couple of positive feedback loops. One appears in the middle part of the diagram and reads clockwise: when teachers' collaborative work with students is more frequent, students' trustfulness toward teachers rises. When their trustfulness rises, the teachers' anxiety about their relations with students declines. When teachers' anxiety declines, the teachers become more ready to engage in collaborative work with students, and the loop strengthens itself. Another positive feedback loop appears at the upper right-hand part of the diagram and reads counter-clockwise. Those positive feedback loops mean that taking one step makes it easier to take other steps. The plan diagrammed in the figure seems a good one. The change project growing out of the planned solution to the problem might show beneficial results in a year or two. That is an example of what we mean by the short-term view.

The teachers and their administrators, much as they might like the plan shown in Figure 5-1, might also take the long-term view. They might wonder how parents would react when they hear that relationships in the classroom have changed. They might wonder, on the one hand, whether teachers might become so happy with the collaborative relationships in the classroom that they would pay less attention to academic learning. On the other hand, they might speculate that collaboration among students would reduce disruptions and permit more time to be given to academic matters. With those musings and others in mind, the teachers and administrators might say to one another, "Let's suppose we reach our target of increased socially constructive behavior on the part of students. Let's imagine that has happened, and we are having a meeting to ask ourselves whether we are now facing a problem of lowered parental satisfaction with our school or a problem of reduced academic performance of students. Would the interaction of other variables with socially constructive behavior by students bring us problems of those two kinds, or not?" The teachers and administrators might list other variables they believe to be connected to those in their plan. They might indicate connections among the variables as in Figure 5-2.

Figure 5-2 reproduces Figure 5-1, but adds a number of further variables. In other words, we present Figure 5-2 to illustrate how a short-term project to solve a problem can be embedded in a larger network of variables that can be affected in the long term. To sharpen the point that every problem is embedded in a larger context, we have shown (in the left-hand part of the diagram) some variables attached to events outside the school. Those variables are of course more difficult for the school to alter than variables attached to events inside the school. Some are

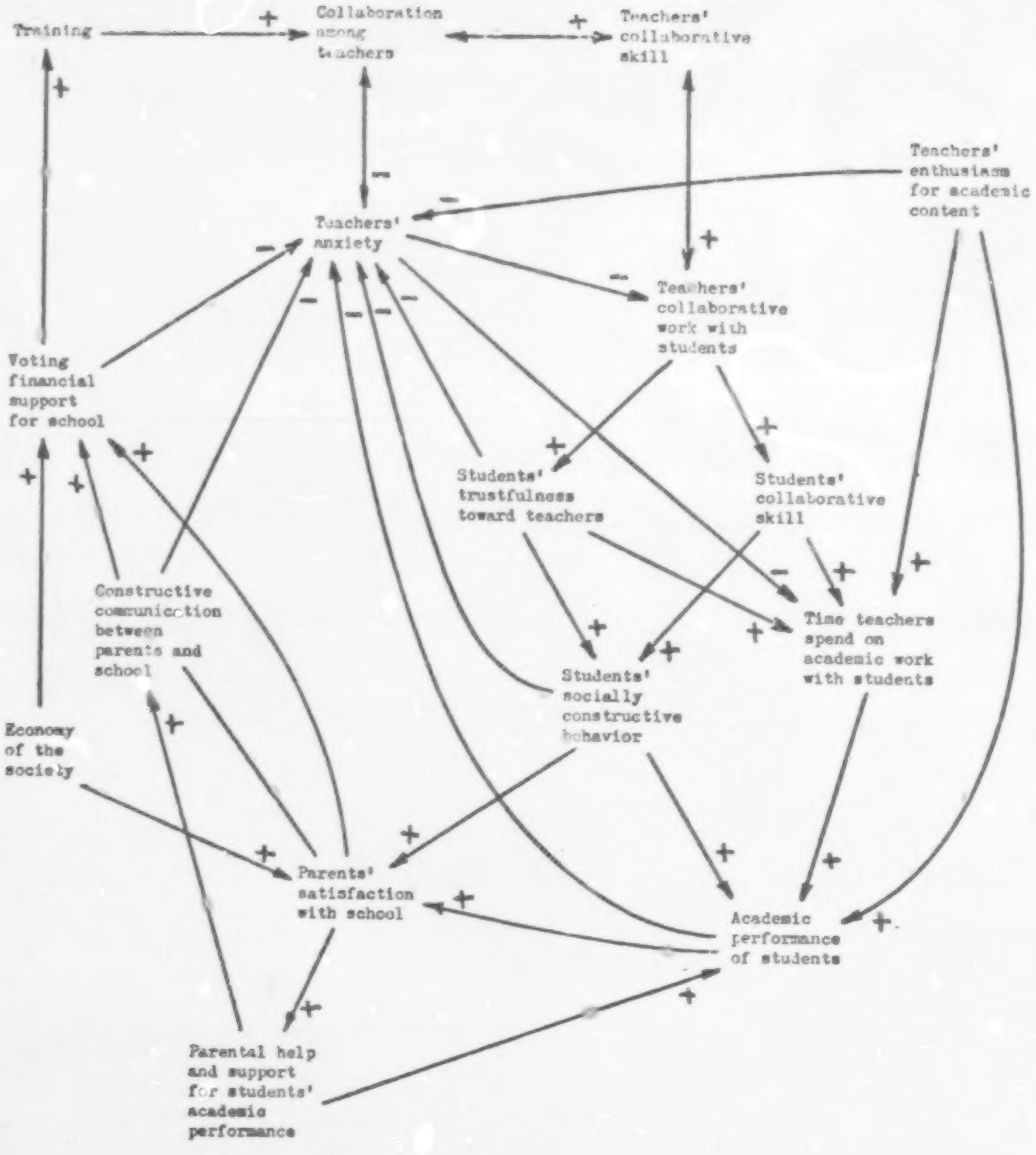
Training
Collaboration among teachers
Teachers' collaborative skill
Teachers' enthusiasm for academic content
Teachers' anxiety
Teachers' collaborative work with students
Voting financial support for school
Students' trustfulness toward teachers
Students' collaborative skill
Constructive communication between parents and school
Time teachers spend on academic work with students
Students' socially constructive behavior
Economy of the society
Parents' satisfaction with school
Academic performance of students
Parental help and support for students' academic performance

Figure 5-2. Examples of some variables and some causal hypotheses connecting them. Increasing the level of the variables (or decreasing, in the case of anxiety) might be taken as steps through which to solve the problems of increasing students' socially constructive behavior, increasing their academic performance, and increasing parents' satisfaction with school in the long term.

completely beyond the power of the school to affect, such as the general affluence in the economy of the society.*

We purposely simplified our examples. A group actually setting out to improve the socially constructive behavior of students would consider more variables than we showed in Figure 5-1, explicitly or implicitly, even if taking the short-term view. Taking the long-term view, the group would consider many more variables than those we showed in Figure 5-2.

A school weakens its ability to sustain a lively capacity for solving problems if it does its problem solving piecemeal, in the short-term manner we illustrated above. It will too often find that it has pounded sand down one rat-hole only to find the rats emerging from others. The highly skillful school will try to anticipate problems that may emerge later by examining a reasonable part of the larger net of variables in which the immediate problem may be embedded, as suggested by Figure 5-2.

Unfortunately, the vicious circle in which too many urban schools are caught makes it very difficult to consider the long term. First, harried schools typically have too little time even to find good solutions to immediate problems, not to speak of time to consider future ones. Second, some members of urban schools hope not to be there very long. They are ready to spend their spare energy hunting for a more pleasant place to work, but not ready to spend energy improving the school they are in now. Both those conditions are serious impediments to solving problems in the school, but we believe they can be partly overcome by efforts from within the school. We gave some suggestions in the later part of Chapter 2.

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*An arrow in the diagram running from "Economy of the society" implies that when parents are more affluent, they are likely to be less critical of the school. That may or may not be true. Readers may also disagree with some other arrows. In actual problem solving, of course, it behooves the problem solvers to be as correct as they can be. But our purpose here is only to illustrate the point that problem solvers can choose to cope only with the variables most obviously and immediately connected with their target, or they can choose to cope also with other variables that may be affected by their problem-solving activities after some lag of time and that may affect the stability of their solution as time goes on.

A third condition is even more discouraging to working with the long term in view. That is the turbulence of the environment. It is very difficult for urban schools to predict much in advance when events originating with the state legislature, the federal government, the courts, local economic developments, or the nation's economy at large, not to speak of directives suddenly issued by the school board or a new superintendent, will require strong alterations in the conduct of affairs inside the school and make useless plans laid or change projects begun. A few experiences with that kind of disruption make members of urban schools very reluctant to use much of their time to plan farther ahead than the present school year.

Effects from the Environment

In this document, we touch environmental effects on schools only in passing, as in the section just above. We want to make very sure, however, that we do not leave the impression that we think environmental events have only minor or infrequent effects on schools. The situation varies from city to city and school to school, of course, but many schools find themselves unable to undertake any long-term program to improve their problem-solving capability because they are already running as fast as they can to keep up with demands coming from outside themselves. To the extent that environmental demands are strong, urgent, unremitting, and impossible to refuse, to that extent the efforts a school makes toward a continuing capacity for solving problems must be halting, partial, sporadic, and retraced after interruptions. It may be that schools overwhelmed by environmental demands would be better off using the occasional lull for rest rather than for bootless effort toward improving their problem-solving skill.

Where does hope lie for the school repeatedly disrupted by sudden losses of tax support, wholesale shifts of teachers among schools, requirements for mainstreaming, impositions of new curricula, great burdens of record-keeping, and so on? It may be that the only hope lies quite out of the hands of the school. It may lie only in reforming the kinds of actions taken in regard to education by local, state, and federal governments. It may await changes in the requirements of industry for diplomas. It may await changes in the qualities industry wants in its workers--creativity and collaborative skills, for example, instead of quiet submission to authority. It may await changes in the expectations of parents.

Some thoughtful observers of American life and education believe that very little can be done from within a school to make life better for students and teachers. Shields (1973), for example, titled his booklet:

The Crisis in Education Is Outside the Classroom. Stavrianos (1976) describes the ways the education of workers differs in societies having different political and economic assumptions. Carnoy (1974) and also Bowles and Gintis (1976) trace the strong influences of the wider culture, especially the presumed need of industry for compliant workers, upon the conduct of schooling. Those authors and Spring (1976) tell how the school, quite aside from its teaching of subject matter, sorts youngsters into groups that make different demands on society's rewards. Rossman (1969), as well as others named here, tells how authoritarianism pervades American life, including the schools. Freire (1972) shows dramatically the hard work it takes to show people at the bottom of Western society's socio-economic ladder, who have been taught that planning, making group agreements, dealing with the bureaucracy, and other verbal skills are not for them to presume to attempt, that they can indeed use their minds and the resources of their group to manage their own lives, learn new ways of doing things, and augment their power. Hirschman (1970) describes important economic choices that affect the influence parents can have on the school. Graubard (1974) represents many of the foregoing authors fairly well when he writes:

> . . . there are only a few relatively high-status, high-salary positions in the professions, business, etc. This condition sets a very important problem for the socializing institutions. The obvious fact is that those with privelege will make every attempt to pass this privelege on to their offspring. The advantaged classes--in wealth, income, power, status--will use these resources to improve the chances of their own children against potential competitors in the supposedly fair and equal race. . . . In fact, if the schools did overcome--by some reformist miracle--all of the societal causes for the "deprivation,"

> the "motivational problems," the "behavior disturbances," etc., ascribed to "disadvantaged" young people; . . . if every young black was "Harlem Prepped" and became able to go to college--what would happen? Would they all get the good jobs that they are promised if only they would shape up? No way! . . . Even if the poor young people believed the exhortations and worked like little beavers and listened to the teacher and tried to talk right and be nice, most of them still couldn't make it. The system has a few winners and a lot of losers, and the winners aren't about to let their children take their fair chance of becoming losers (pp. 257-259).
>
> Children are compelled by law to undergo a schooling system that hurts them in many ways. Free schools are a very small attempt to get some of them out from the most immediate oppression of the school. The idea of freeing all the children, even to the modest extent represented by the best of the free schools, is a good dream, but a dream nonetheless. It can't be otherwise in a society where the kinds of freedom, social relations, and opportunity for personal development that are part of the dream are not possible for most people, whether adults or children. Part of the important changes in education proper will come from trying to bring about some big changes in the larger society. To the extent that this movement for social change succeeds, we will become more able to transform what now seem like romantic hopes for the lives of a few children into real historical possibilities for all (pp. 303-304).

Our own view is that reform must start someplace, and it may as well start anyplace and everyplace. It may very well be true that schools in general are limited in what they can do until the society changes. But in the meantime, as we said in Chapter 2, there are some people, some places, and some times in urban schools where change can begin and capacity for problem solving can improve.

We limit this document to what can be done in schools, The document is addressed to members of schools, their consultants, funding agencies, and other kinds of helpers to schools. The variables we list below are therefore limited to those attached to schools and their members.

Selecting Variables

Variables become useful to school improvement when (1) members of schools and their helpers can agree fairly well on what the variables mean, (2) fairly reliable methods can be worked out that enable people to agree on whether an action or an utterance is an indicator of some level (degree) of a variable, and (3) members of schools come to agree fairly well that knowing the level of a variable enables them to take some constructive action they could not take otherwise. We limit our attention in this document, with few exceptions, to variables for which there is reasonable evidence that they can be altered by known methods and that knowing their levels enables members of schools to take action to alter them. We have already cited some of the evidence for some of the variables in earlier chapters and in Appendix A. Other evidence comes from the documentation produced from the DTA project. There is now considerable evidence about variables in the literature on change in school organizations, and a good deal is relevant to schools in the larger literature on change in other kinds of organizations. Even the literature on change in schools, however, is now too large to be farily reviewed here. The bibliography by Runkel and Burr (1977) annotates much of the relevant recent literature and most of the recent investigations into organizational change in schools.

Because the central topic of this document is organizational problem solving, we omit variables pertaining directly to classroom pedagogy, though we make sure skills in pedagogy and other technical tasks are not forgotten by including them in variables 2 and 30.

Virtually all the variables having important effects on solving problems in schools are attached to people, either singly or in groups. A variable can be attached to an individual, as an individual's willingness to participate in changes in roles. A variable can be attached to a group of persons, as a group's skill in making clear decisions. A variable can be attached to a school, as the strength of the norm in a school for persevering in the face of frustration. A variable can be attached to an interface, such as the ability of a joint committee to clarify issues that concern both the represented groups. And so on. The list in the next section is organized by the place the variable is attached.

List of Variables

The list below is organized into two main parts. The first part contains conditions characterizing individuals, interfaces, and systems or subsystems. The second contains skills exhibited by individuals, interfaces, and systems or subsystems. Within each of the two main parts, variables are grouped by their attachment: to individual, interface, and system or subsystem.

Conditions

We list only one variable in the first sub-category of conditions. The sub-category is a condition attached to an individual and significant when it reaches an especially high or low level in any key individual. The variable is:

1. Willingness of the administrator to support changes in the roles of others by making reciprocal changes in his or her own role. (Change is much more difficult when the administrator says, "You go ahead and change, but don't ask me to do so.") In a period of stability, the corresponding variable is the willingness of the administrator to support stability in the roles of others by keeping stable his or her own reciprocal part of the role-relationships.

The second sub-category of conditions contains conditions attached, at least at the outset of a change project, to the environment or to the interface between system (or subsystem) and environment:

2. Extent and kind of technical knowledge needed for a change or needed to maintain present procedures. (By technical knowledge, we mean knowledge of pedagogy, subject-matter, curriculum making, bookkeeping, legal procedures, how funding agencies operate, when referenda concerning schools will be held, and so on. We consider this variable to be attached to the interface between school and environment because the technical knowledge used in the school is partly specified by school board, parents, legislature, local business, and so on, and because, during either change or stability, the school's reservoir of knowledge must include knowledge of what is going on in the environment, of the appropriate channels for communicating with sectors of the environment, and so on. This variable complements variable 31. Obviously, this "variable" is actually a cluster of variables.)

Having just distinguished a variable from a cluster of variables, we should say that a precise definition of variable is not necessary to our purpose here. If the reader's intuition agrees with our statement about variable 2 actually being a cluster of variables, that intutitive understanding will suffice. For a technical discussion of defining variable, dimension, measurement, and the like, see, for example, Runkel and McGrath (1972, pp. 326-327).

3. Accessibility of appropriate expert services or technical information from outside the system or subsystem. (When a school needs to reach out for consultants or technical information, the school is more likely to pursue those resources, acquire them, and put them to use if the school does not have to reach over many miles, thread through a telephone network to the right person, struggle through snarls of red tape, or pay a high price in dollars. This variable complements variable 42.)

4. Accessibility of financial resources. (This variable also complements variable 42.)

5. Rate of turnover of membership in the school or subsystem, especially of members who are key for one reason or another. Conversely, this is average tenure or longevity in position. (We put this at the interface between school and environment because, obviously, people leave the school more or less readily depending on how readily the environment makes a place for them elsewhere.)

The third and largest sub-category of conditions affecting problem-solving capacity (or stable background for it) in the school is that of conditions attached to system or subsystem which, at certain levels, aid or impede problem solving:

6. Complexity of the school organization. Alternatively, the

distribution and degrees of loose coupling. (This variable is connected to size, but not in a simple way.* There is probably more than one variable here.)

We now need to explain the phrasing of several of the variables in the remainder of this sub-category. Variable 7 and several others are described as distributions of some quality among the individuals in school or subsystem. We phrase them that way--in contrast to the first sub-section that asserted a quality attached to "any key individual"--because their effect on problem solving does not come very much from any one individual or from the simple average level of the variable over individuals. The effect does not even operate, necessarily, through a norm that rewards the exhibition of a high level of the variable. If the variable reaches a high enough level in a sufficient proportion of the members of school or subsystem, it facilitates problem solving, even though the norms in the school may merely permit the elevation of the variable without giving it particular reward. The variables characterized below as "distributions" operate through their "bulk" or "mass" in the school or subsystem. We cannot specify quantities precisely or--in most cases--even approximately. In the present state of the art, all we can say is that if some proportion of members greater than a majority (in some cases a larger proportion will be required) evinces a level of the variable that other members perceive as more favorable than the average in most organizations with which they are acquainted, then the problem-solving capacity in the school is likely to be enhanced.

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* Investigators of human organizations frequently find themselves grappling with an intuitive notion of complexity. So far, no single conception of complexity has captured the allegiance of a plurality of researchers or theoreticians. Some representative writings on the topic are those of Baldridge and Burnham (1975), Barker and Gump (1964), Bell (1977), Charters (1970), Cohen and Bredo (1975), Cohen and others (1976), Davis (1977), English (1977), Hage (1965), Hickson and others (1971), Ianni (1974), Kasarda (1974), Mechanic (1962), Meyer and Rowan (1975, 1976), Segal (1974), Weick (1976), and Williamson (1974).

7. Distribution of individuals' accuracy (that is, the proportions of members having different degrees of accuracy) about the communication net of which members are a part.

8. Distribution of proportions of tasks (within different domains of the school's work) for which norms call for carrying out the tasks cooperatively, competitively, or individualistically. (Another cluster.)

9. Distribution of the salience (strength over various situations) of individual motives of achievement, power, and affiliation; that is, proportions of members with various profiles of salience of those motives.

10. Distribution of the frequencies with which individual motives of achievement, power, and affiliation are satisfied in the school.

11. Degree of support given by administrators to a change project (or to maintaining the present pattern of stability). (Giving "support" means giving some sort of resource: services, materials, money, information, status, or affection.)

12. Distribution of individuals' dissatisfaction with the gap between the present state and the desired state; that is, the proportions of members feeling different degrees of dissatisfaction. This variable has a linear relation to maintaining stability: the less dissatisfaction,

the easier it is to maintain stability. It has a curvilinear relation to change: both too little and too much dissatisfaction endanger the success of orderly, planned problem solving.

13. Distribution of the valuing expressed by individuals for a proposed target of change (or for the present stability); that is, proportions of members who show by word or deed that they place a high value on the proposed target of problem solving (or upon the present stability).

14. Distribution of anxiety (feeling stressed or threatened) among members, regardless of the source.

15. Distribution of available energy; that is, proportions of members having different amounts of energy available outside their daily routine duties.

16. Distribution of individuals' estimates of the energy per unit time that they would be required to expend before a proposed problem-solving project would bring benefits--or estimates of the energy per unit time being devoted to maintaining stability.

17. Distribution of individuals' confidence that a proposed problem-solving project has the capability, given any feasible amount of time and energy, of bringing benefits. The aspect of this variable pertaining to stability is the distribution of confidence that the staff can maintain the present way of doing things against external forces beyond their control.

18. Distribution of individuals' estimates of the time that will be required for a problem-solving project to bring benefits, compared to the actual time required; that is, over-pessimism versus over-optimism,

or too little feeling of urgency versus unrealistic demand for speed. There is no corresponding aspect of this variable for maintaining stability.

We just mentioned a comparison with "the actual time required." People who are eager to start a change project but have had little previous experience in changing norms had role-relationships are likely to be unrealistically optimistic. In one case in the DTA project, a group of counselors estimated at one-and-one-half hours a task that we estimated at six to eight months (see Francisco, 1978). We mentioned other experience in DTA with time perspective in the sub-section on "Where Schools Are Now" in the section on "Searching for Information and Other Resources" in Chapter 4.

There is no handbook that tells in a few words how to read auguries and declare the time needed for a particular change project in a particular school. The knowledge resides in the experience of change agents and in case studies in the literature. Now and then writers risk semi-quantiative estimates in print. Franklin (1975), for example, says, "If this period of slightly greater than a year provides a reasonable estimate of the required lag period for significant change to move down one level in a hierarchy, it is clear why major changes in management systems of organizations have been estimated to require several years to really take effect" (p. 161). To estimate "actual time" for variable 18, a school without experienced change agents of its own should call in one from outside.

19. Distribution of individuals' willingness to undergo at least a few hours of training early in the sequence of steps through which

the school intends to reach its chosen target. This variable does not ordinarily apply to maintaining stability, though the common expectation that teachers will attend summer school might perhaps be considered an application.

20. Distribution of individuals' confidence that key administrators will continue in position until at least a year after the target of the problem solving has been reached. (If too many members of the school believe the principal is likely to depart while the problem solving is under way or before it has not become instutitionalized, they will worry that the next principal may not support the work.)

21. Distribution of individuals' expectations that change requires a transition period is which the norms must be different from those appropriate during a period of stability.

22. Distribution of individuals' willingness to risk new action within or on behalf of the school; includes willingess to change role behavior. Does not ordinarily apply to maintaining stability.

23. Strength of norm for perseverance in the face of frustration.

24. Strength of norm that supports continuing to work on task while in a state of emotional arousal versus calling work to a halt while people "quiet down." (Though heightened emotion narrows perception, it narrows it in different ways for different people, and a skillful group uses the group's perceptual resources. Furthermore, if the group postpones work until members can suppress outward evidences of their emotion, the members are also likely to hold back the causes of their emotion, and that deprives the group of valuable diagnostic information.)

25. Strength of norm supporting exposure of individuals' worries, frustrations, and pains in face-to-face communication; that is, a norm that encourages confronting others with one's own needs or dissatisfactions.

26. Distribution of individuals' trust in other group members--that they can and will do their necessary part in the work of solving problems.

27. Distribution of the trust of one group in other groups or interfaces--that they can and will do their necessary part in the work of solving problems.

28. Extent of agreement or expectation in the school that a particular set of steps or stages will be used when processing problems--that there is a sort of standard agenda that can be brought into use when dealing with a problem.

29. Distribution among individuals of the conception of humans as complex and inherently active, self-motivating, creative, and capable of unending varieties of conceptions of the world they live in, as explained in Chapter 3.

30. Distribution among individuals of the conception of the school as complexly built of subsystems and inherently multiply-motivated, full of complex images of itself and its environment, full of creativity, subject to conflict that naturally arises from the creativity and disparate images, and subject also to conflict that naturally arises from impulses to different actions under threat, as explained in Chapter 3.

We turn now to the second main part of our list--the part listing skills.

Skills

The first sub-category of skills contains skills attached to individuals and significant when they reach especially high or low levels in any key individual:

31. Skill in the content or technicalities of the convening task--for example, pedagogy, subject-matter, curriculum making, bookkeeping, legal procedures, how funding agencies operate, when referenda concerning schools will be held, and so on. This variable complements variable 2.

32. Charisma of leadership in the sense we described it in Chapter 4 in the section on "Mobilizing Synergistic Action."

33. Skill of key individuals in conceiving a problem as a gap between present state and a more desired state. Corresponds to variable 38.

The second sub-category of skills contains skills attached to system or subsystem and oriented toward group dynamics:

34. Skill as a group in communicating accurately--a cluster of skills such as checking understanding of oral utterances, helping others to achieve clarity, and so on. (For more detail, see the section in Chapter 3 on "Groups" and the references footnoted at the opening of the section on "Two Persons" in that same chapter.)

35. Skill as a group at making clear decisions.

36. Capacity or skill of group to accept (work productively with) members exhibiting a variety of values, life-styles, cultures, ethnicity, and so on.

37. Skill as a group at making use of outside helpers. (Another cluster.)

The third sub-category of skills contains skills attached to school or subsystem and oriented toward problem-processing:

38. Skill as a group at formulating a problem as a gap between present state and a more desired state. The group skill goes beyond the assembly of individual skills, as we explained in the section on "Groups" in Chapter 3.

39. Skill as a group in processing problems. This skill depends on having a commonly understood procedure, such as the one we described in the sub-section on "Solving Problems" in Chapter 3. It also depends on such skills as effective communication (variable 34), coordinated role-taking, and so on. (This variable corresponds to variable 28.)

40. Skill (we called this a "meta-skill" in Chapter 4) as a group at diagnosing the functioning of the group or school.

41. Skill (meta-skill) as a group in getting information and other personal resources from its own members.

42. Skill (meta-skill) as a group in getting information and other resources from outside the group. (This variable complements variables 3 and 4.)

43. Skill (meta-skill) as a group at synergistically mobilizing the actions of members and of the group as a whole.

44. Skill (meta-skill) as a group in monitoring and assessing the efficacy with which the other meta-skills are being applied.

At this writing, that list seems good to us. With further research, it will certainly need to be altered, perhaps cutting the reality in somewhat different ways, and certainly articulating better with environmental variables than we are able to do now.

Carrying Out a Change Project

Now that we have listed 44 variables that can have important effects on the success of solutions undertaken to answer serious problems, it may seem that schools will have their hands full juggling all those variables at once. Fortunately, it is not necessary to do so. Four circumstances simplify the process of carrying out organizational change.

First, not all of the variables, nor even a majority of them, go to dangerous levels at any one time. At any given time, some of the variables, sometimes even most, can safely be neglected while dealing with others, because not all the variables are tightly coupled one to another. For example, the key administrators may be willing to change their roles as required (variable 1), the technical knowledge needed for the change project may already be present in the staff (variable 2), the services of appropriate experts may be readily available (variable 3), enough money may be in hand (variable 4), staff turnover may be low (variable 5), the organizational complexity of the school may be moderate to low (variable 6)--those and other variables may be at favorable levels and may change very little while the school works to increase the accuracy of staff about the communication net in the school (variable 7) and to increase the proportion of tasks that are organized cooperatively (variable 8).

Second, although one variable may depend on another, there are often delays between a change in one variable and the consequent change in another. For example, if one group in the school gets some money (variable 4) to work on a particular problem, if they design the project to be collaborative (variable 8), if, as they move along with the project, the anxiety they have about their work in the school goes down (variable 14), and if their affection for one another rises (variable 10), then the group will show the signs of a cohesive in-group with high esprit de corps. The result of that will very likely be, if nothing is done to ward off the effect, that other groups in the school become anxious and wary (variable 14), and mutual trust between groups may drop (variable 27). But there is usually a delay of some weeks between the time a group begins to build a collaborative, highly interdependent way of working and the time other groups in the school begin to notice their changed norms. The interim allow change agents to begin readying other groups to coordinate with the first before intergroup trust levels become a problem in themselves.

Third, since some variables do have rather quick causal effects on others, the work put in to alter one variable often suffices to alter one or more variables affected by the first. For example, if anxiety in a subsystem (variable 14) is reduced from a previous high level, then (for the reasons given in the sub-section on "Downshifting" in Chapter 3) communication in the group will convey intended meanings at least somewhat more accurately (variable 34). In other words, one accomplishes improvements in communication while working to reduce anxiety.

Fourth, the very process of change requires that one give attention to certain variables before certain others. For one thing, if a problem-solving school or subsystem chooses a solution that calls for changes in norms and role-relationships, the general level of anxiety will inevitably rise. Individuals will find themselves called upon to change their customary routines, to change the kinds of resources they exchange with particular others, and to change the demands they feel are legitimate to make upon others or to accept from them--all changes that make the workaday world seem unsteady and threatening. Given the fact that feelings of threat and anxiety reduce creativity and time perspective, making the transition to a new way of doing things more difficult, it follows that variables that can be used to reduce anxiety should receive early attention. Possible choices are support from administrators (variable 11), expressions of valuing the project from key people (variable 12), and realism about the time the project will take so that anxiety is not aroused from disappointed over-optimism (variable 18).

For another thing, some skills can be developed only after developing others. For example, a school or subsystem might have low skill in conceiving a problem as a gap between a present state and a more desired state (variable 38). In that case, it would be a waste of effort to do very much about improving skill in diagnosis (variable 40), because the group would have no organizationally useful way of making sense out of reactions to frustration. In sum, change agents must delay treating certain variables until their prerequisites are brought to adequate levels.

Those four circumstances permit--indeed, even require--a certain amount of staging in a project designed to bring about changes in norms and role-relationships. That is, participants will do better if they concentrate on certain variables at certain stages and others at others. We will say more about that below.

Recycling

Changing norms and role-relationship in a school is not a simple straight-line process. Almost every part of it is cyclical. To illustrate what we mean, consider the pervasive activity of getting information. At a very minute interpersonal level, one person may say to another, "Ramona, I'm not sure I'm getting the meaning you want me to get. Do you perhaps mean that . . . ?" Later, in a group meeting, the same questioner may say, "I think we need to know more about the worries parents might have about what we are proposing to do. And now that I understand Ramona's view better, I'd like to hear her advice about how to anticipate the worries parents might have." Later on, parents might be interviewed about the school's plan. (Then Ramona might be asked to help interpret the answers obtained from parents.) The answers from parents connected with one school might be compared with the answers from parents connected with another school. After the school puts it plans into action, parents might be interviewed again, and their answers to questions about the action compared with their answers to questions about the plan. And so on, one information-gathering becoming incorporated into another information-gathering in a wider context, the information-gathering recycling as the work moves into different phases or wider contexts.*

Work of one sort or another is also recycled when new people come into a change project. That can happen because of turnover in personnel, and it can also happen if a change project begins its work with one group and then moves on to another. Work must also be recycled if the intended outcomes for a particular phase are not achieved and that step must be retraced. For all those reasons, recycling is a common phenomenon in change projects.

In the next main section of this chapter, we will lay out some phases of work we think helpful to designers of change projects in urban schools. We will incorporate the idea of recycling in two ways. First, the basic list of phases contains two cycles of working on problems, the second building on what is learned in the first cycle. Here is the basic list of phases:

Start-up,
First cycle of work with locally proposed problems,
Strengthening the effectiveness and cohesiveness of the first
  target subsystem,
Second cycle of work on problems,
Increasing meta-skills.

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* For an example of recycling in diagnosis, see Schmuck, Runkel, Arends, and Arends (1977, pp. 45-46).

Second, that basic list is reiterated with subsystems and interfaces beyond the first, as follows:

Work with second target subsystem (and with third, etc., as necessary),
Work with first interface (and with second, etc., as necessary),
Work with multiple interfaces,
Work with total system,
Institutionalization.

Start-Up and Readiness

Though we will include start-up as one of the phases we describe in the next section, we take extra space for it here because of the crucial importance of readiness at the time of start-up.

Though start-up is often written about as if it were peculiar to change projects, a very similar phase of work recurs during periods of stability. Administrators and others are familiar with it. New superintendents and principals may not use the term "start-up" to describe their first days on the job, but they know that those first days are an auspicious time to ascertain the expectations and customs in the organization, to find the channels of communication they will need, to make their own expectations clear, and to do, in general, the kinds of things change agents do during start-up. Administrators know, too, that start-up must be recycled from time to time. Most administrators, for example, take some time for start-up-like activities at the beginning of each new school year.

Not only administrators, but everyone engages in start-up-like activities upon joining an organization and recycles the activity periodically. Secretaries, teachers, students, and janitors all spend some time in feeling out their positions in the organization, setting some sorts of standards and goals, and letting others know their degree and time-span of commitment to the organization. In brief, start-up occurs, though in different guises, under both change and stability.

The key question during start-up is, "What can I do here? What will these people accept from me? What are they ready for?" Whether a change-agent is someone who is a member of the school, a group in the school, or a person or group from outside, that kind of question is crucially important at the beginning of a project that proposes to change norms and role-relationships. Another way to phrase the question is, "With which variable should I start--x, y, or z?"

One should start, of course, by altering variables that make other variables easier to alter in turn. Some schools or subsystems of schools need a great many variables altered before they can achieve a strong capacity for solving problems. Others have a good many variables at the right levels and can skip a good many stages of development that other schools would require. A school or subsystem can be ready, not so ready, or not ready for one or another stage of the work of developing a good capacity for solving problems. Thinking especially of the first stage, a school can be ready, not so ready, or not ready to start up a project to develop that capacity. In the next section, we will lay out some phases of developing a capacity for solving problems and list the variables that are appropriate to bring to proper levels during each phase.

It should be clear by now that no standard "package" can be put together which, whether offered to schools or pressed upon them, can be guaranteed to move even a majority of them to a heightened capacity for solving problems. In Chapter 3, we dwelt upon the uniqueness of schools, their members, and their situations. In Chapter 4, we described four meta-skills that were the marks of a mature capacity; the application of those skills is also unique to every separate setting. Here, we have just pointed out that schools will differ in the variables that it will be appropriate to alter when starting up a project to increase the school's capacity to solve problems. As we said in the sub-section on "Solving Problems" in Chapter 3 and in the section on "Diagnosis" in Chapter 4, the first step in undertaking any problem, whether it is a specific content problem in the daily work of the school or the problem of increasing the school's capacity to solve problems, is to diagnose the present situation so that one can know where to begin.

Phases of Change

To think about how a change project itself changes as it goes along, it is possible to slice it, in one's imagination, in several different ways. Several authors have proposed useful lists of phases. The list we set forth below suits our thinking at the present. It contains phases that we find useful in thinking about urban schools beset with difficulties. A simpler list of phases might be more useful in thinking about less complex school organizations.

We do not wish to suggest that phases occur one after another in simple sequence. We have chosen phases here that are distinguished by their purposes. As we said under "Recycling," any of the purposes must receive attention at more than one time during a change project. But neither do we wish to suggest that one order is as good as another.

The reader may find it useful to think of each phase as getting ready for the next phase. Our experience gives us the conviction that a school with inadequate skill in one phase will have a hard time with the activities of the next phase, a harder time with the phase after that, and so on. When participants in change struggle too unfruitfully with the work of a phase, usually the best thing to do is to put in more work on the skills of the previous phase.

When problem solvers decide that reaching their target will require changes in norms and role-relationships, we use the term "change project" to label the steps they take to alter the norms and role-relationships. A change project can be very small in scope, involving only a handful of people and requiring only a few weeks or months, or it can be very large, involving the entire school, perhaps its students and parents, perhaps requiring detailed coordination with the district's central office and other schools, and requiring several years of effort. We have written the descriptions of phases below as if the project were very large. We have written them in fact, as if the target were to achieve a sustained capacity for solving problems. The reader should understand that some of the phases and recyclings we describe will not be necessary in smaller projects.

discretion about change projects they are allowed to undertake in their schools without consulting the central office; in other districts, principals are required to get permission for most non-routine activities. Since we are writing here as if the change project were a large and significant one, we include as the first phase a period of gaining acceptance from both the target system and its supra-system. A special period of gaining tentative acceptance is necessary whether the leaders and change agents are insiders or outsiders. The need is obvious when outside consultants are brought in. Even when the change agents are insiders, however, they become to some extent outsiders because they are now acting in new roles. Whenever a person moves to a new role in an organization, there is always a period when the person is on trial. That is as true of moving into the role of leader in a change project as it is of any other shift of role.

Activities. In this phase, the leaders of the change project take steps to become known to key persons and subsystems (groups). They seek out and become acquainted with those who are centers of power of any sort, including persons who are nexuses in the communication net. They make preliminary agreements about roles, goals, standards, schedules, scope and boundaries of work, locations, and ethics.

Intended effects of activities. In Phase One, the chief intention is to increase awareness among participants of the importance of certain variables. A few variables can be altered to some degree, even if only a little, during this early phase; in particular, variables 1 (willingness of administrator to make reciprocal changes in his or her own role), 11 (support from administrators by giving resources), and 13 (expressing valuing of the project). In the next sub-section, we list those three variables and also other variables for which awareness is the goal in Phase One.

Methods likely to alter variables. So that the reader can get some sense of procedure and scope of work in bringing about new norms and role-relationships, we include here some suggested methods of altering variables. During the course of our work as consultants and researchers in organizational change in schools over the past eleven years, the following classification of methods has come to seem useful to us.

Presence of project's leaders. Some useful alterations in the consciousness of participants result when the project's leaders merely "hang around," talking with participants informally as opportunities arise, and generally just "soaking in." This happenstance prowling about serves to give participants enough acquaintance with the project's leaders so that participants are not left to generate fears about unknown ghosts. (Indeed, sometimes consultants or project leaders move too fast to use other methods only to find that participants have actually pushed them into the method of "hanging around.") A few of the variables in our list can actually be altered somewhat by this method; for example, participants can pick up some information that can help them estimate how much energy the project will require of them (variable 16) and when they might expect to begin reaping some benefit from the project (variable 18).

Participants' interactions. As a project moves along and participants get more interested in it, they often augment what the project's leaders do; they pass on information, influence one another, urge action by others, model new behavior, and so on. Sometimes, of course, they do things the project leaders wish they had not done, but that is only an exhibition of the infinite variety of individuals' images of the world they live in, and part of the "material" with which change agents work.

Process consultation. This method consists of change agents sitting in on conferences, meetings, and other gatherings and giving suggestions from time to time about ways the work might be facilitated.

Data feedback. In this method, data about the functioning of participants are gathered (either by insiders or outsiders), and the data are then shown to the participants, usually after being summarized and the identities of individuals removed. Participants can then use the data to plan further action.

Outside information. Participants can seek information from outside their own system or subsystem when they believe the information immediately available to them is insufficient.

Outside resources. Participants can seek other resources from outside.

Training. This is direct training or teaching, often conducted away from the school, to enable participants to learn new ideas or skills in a shorter period than they could during an occasional free hour in the ordinary week's schedule.

Negotiation. This method of altering variables occurs when participants or groups of participants negotiate or bargain with one another or with the project's leaders or consultants.

In the tabulations below, we will abbreviate the above methods, respectively, as presence, parti'pants, consult, data-feed, out-info, out-res, training, and negotiate.

In the first tabulation, we list variables suitable for attention in Phase One. The numbering of the variables is the same as in the earlier "List of Variables." The phrase after the number is a brief reminder of the description of the variable in the earlier list. An "x" in a column means that we think themethod labelling the column is a likely way to alter the variable. When the phrase for the variable is preceded by the word AWARENESS, it means that the intention in this phase is only to raise participants' awareness of the importance of the variable, not necessarily to alter its level or distribution. Awareness can, however, be raised by the same methods that can alter a variable.

Variable	Presence	Parti' pants	Consult	Data-feed	Out-info	Out-res	Training	Negotiate
1. Administrator's willingness to change own role		x	x	x			x	x
2. AWARENESS of need for technical knowledge.	Need for knowledge not alterable directly							
11. Administrators' support for change.		x	x				x	x
12. AWARENESS of distribution of dissatisfaction.		x	x	x				
13. Expressing valuing of target.		x	x	x				

Variable, cont.	Presence	Parti'pants	Consult	Datafeed	Outinfo	Outres	Training	Negotiate
16. AWARENESS of estimates of energy required.	x		x		x		x	
18. AWARENESS of estimates of time required.	x		x		x		x	
19. AWARENESS of willingness for training.			x	x	x			
20. AWARENESS of whether administrator will continue.		x						
21. AWARENESS of need for transition period.			x		x		x	

Phase Two: Start-Up with First Target Subsystem

Extended work in a school to change norms and role-relationships often starts with one or two subsystems rather than with the school as a whole. That is usually a necessity for logistic reasons if the staff of the school is larger than 50 or so. Later, work begins with other subsystems, and still later with interfaces among the subsystems. The purposes of Phase Two are the same as Phase One, but the focus is the first target subsystem.

Activities. The activities in Phase Two are the same as those in Phase One, but directed to the first target subsystem and carried to greater depth, with the intent of making significant changes in a few variables.

Methods Likely to Alter Variables

Variable	Presence	Parti' pants	Consult	Data-feed	Out-info	Out-res	Training	Negotiate
14. AWARENESS of anxiety.	Not directly alterable; responds to changes in other variables.							
17. AWARENESS of confidence that project will work.		x	x		x			
19. Willingness to undergo training.			x	x	x			
21. Expectation of transition period.			x		x		x	

Also variables 1, 11, 12, 13, 16, 18, and 20 as tabulated under Phase One.

Phase Three: First Cycle of Work on Locally Proposed Problems

This is where serious work begins. Change agents accept problems as proposed by participants, as we said in the sub-section on "Start with the Participants' Own Problems" in Chapter 2. Change agents do, however, encourage use of a systematic problem-solving procedure--see the sub-section on "Solving Problems" in Chapter 3. They also encourage data-collection-and-feedback and other methods of getting needed information. Most urban schools are not ready for concentrated training in this phase. That is the reason we include a second cycle as Phase Five.

Activities. Explore aspects of problems. Formulate problem statements as gaps. List and assess restraining forces. Choose first steps and begin actions. Adapt materials and methods to local needs and customs. Begin informal diagnosis of group functioning.

In the list below, we describe briefly some typical activities in each phase, list some variables we think especially suitable for alteration there, and name some methods of altering them. We speak of altering variables because directional words like raising and lowering do not describe very well what sometimes needs to be done, especially in the cases of our variables that are actually clusters of variables and in the cases of those we have described as distributions. (What needs to be done is almost always rather obvious, and we will not go into detail about it.) We could speak of optimizing variables (bringing them to levels that would maximize capacity for solving problems), but not all variables need to be brought to optimum at every phase of the work, and speaking of optimizing would lead us into qualifications that would distract us from the main point, which is merely to list matters that deserve attention in each phase. So we simplify by letting the subtleties hide under the word alter.

Phase One: Start-Up with System

When starting a change project, the first necessity is to gain tentative acceptance for the project from the people who are the "gatekeepers" for the supra-system. That is, if the project is to engage a school as a whole, it usually needs approval from the district's central office as well as the principal. If the project is to engage part of a school, it needs approval at least from the principal, if not from the central office. In some districts, principals are allowed a good deal of

Methods Likely to Alter Variables

Variable	Presence	Parti' pants	Consult	Datafeed	Outinfo	Outres	Training	Negotiate
9. AWARENESS of individual salience of motives of achievement, power, affiliation.	Not very alterable, and not directly							
10. Frequency of motive satisfaction.		x	x				x	x
11. Confidence that project will work.		x	x		x			
22. Willingness to risk new action.		x	x	x			x	x
26. Trust in other group members.		x		x			x	x
27. AWARENESS of trust in other groups.		x		x			x	x
28. Agreement to use systematic problem solving			x				x	
33. Individual skill in conceiving problems.			x				x	
34. Skill in communicating in group.			x				x	
35. Group skill in making decisions.			x				x	
36. Accepting life-styles, ethnicity, etc.		x	x	x	x		x	
37. AWARENESS of skill at using outside helpers	x	x	x				x	
38. Group skill in conceiving problems.		x	x				x	
39. Group skill in processing problems.		x	x				x	

Also variables 12, 13, 14, 16, 18, 19, and 21 as tabulated earlier.

Phase Four: Strengthening the Cohesiveness and Effectiveness of the First Target Subsystem

Though problem solving continues, change agents now turn more of their attention to the processes in the group that we discussed in the sections on "Groups," "Two Persons," and "Images of Images" in Chapter 2. The purpose is to heighten openness of communication and trust and to develop the interpersonal coordinating skills that support effecting problem solving in the group.

Activities. Continue working the locally proposed problems. Heighten awareness of interpersonal skills and problem-processing skills. Heighten skills. Improve linkage to information and other resources from outside. Subsystem may be ready for concentrated skill training.

Methods Likely to Alter Variables

Variable	Presence	Parti' pants	Consult	Data-feed	Out-info	Out-res	Training	Negotiate
7. Accuracy about communication net.		x		x			x	
16. Estimates of energy required.	x		x		x		x	
18. Estimates of time required.	x		x		x		x	
24. Norm to continue work during emotion.			x	x			x	
25. Norm to expose worries and frustrations.			x	x			x	
29. Conception of humans as active, creative, etc.			x	x	x		x	

Variable, Cont.	Presence	Parti' pants	Con sult	Data-feed	Out-info	Out-res	Training	negotiate
30. Conception of school as complex, creative, etc.			x	x	x		x	
31. AWARENESS of individual technical skills.		x			x		x	
32. Charisma of leadership.			x				x	
37. Skill at using outside helpers.	x	x	x				x	
40. Meta-skill of diagnosing group functioning.		x	x				x	
41. Meta-skill of getting resources from members.		x	x	x			x	
42. Meta-skill of getting resources from outside.			x		x		x	
43. Meta-skill of mobilizing synergistic action.		x	x				x	
44. Meta-skill of monitoring other meta-skills.		x	x				x	

Also variables 9-14, 17, 19, 21, 22, 26-28, 33-36, 38, and 39 as tabulated earlier.

Phase Five: Second Cycle of Work on Problems

After some experience in working at problems systematically and after improving their interpersonal skills and problem-processing skills, members of the subsystem reconceive their problems to some extent--sometimes in minor ways, sometimes radically.

Activities. Check effects of steps taken in Phase Three. Re-examine problem formulations. Revise targets, restraining forces, action steps, or other aspects of the problems as necessary. Adapt materials and methods. Assign actions. Monitor progress. Continue diagnosis of group functioning. Continue strengthening group cohesiveness and effectiveness.

Methods Likely to Alter Variables

Variable	Presence	Parti'pants	Consult	Data-feed	Out-info	Out-res	Training	Negotiate
8. Proportion of cooperative, competitive, and individual tasks.					x		x	x
15. AWARENESS of distribution of available energy.	Not directly alterable; responds to changes in other variables							
23. Persevering despite frustrations.		x	x				x	
31. Individuals' technical skills.		x			x		x	

Also variables 9-11, 13, 14, 16-18, 24-26, 28-30, and 33-44 as tabulated earlier.

Phase Six: Increasing Meta-Skills

In this phase, members of the subsystem will spontaneously generate meta-problems. By meta-problems, we mean the problems that arise in problem-processing; that is, the problems the group sees emerging in its processes or methods as it works on its content or technical problems.

Activities. State targets for meta-problems, restraining forces, action steps, and procedures for monitoring progress. Assign tasks. Monitor. Anticipate meta-problems that will arise when this subsystem interfaces with other subsystems.

Methods likely to alter variables. No new variables come in for attention in this phase. Give attention, as necessary, to variables 7, 9, 10, 13, 14, 19, 21-23, 26, 29, 30, and 32-34 as tabulated earlier, especially the meta-skills 4-44. The meta-skills were the subject of Chapter 4.

Second and Other Subsystems

Work with subsystems in a school can be scheduled in various ways depending on their readiness, the number of skilled change agents available, special rhythms of work-loads during the school year, and other considerations. Once a subsystem begins the work of improving its capacity for solving problems, however, it should keep at it. If a group turns its attention away from solving problems for a couple of months or more before it has achieved a strong capacity, the group skills acquired so far will deteriorate and an earlier phase or two will have to be recycled.

Interfaces

In moving toward a strong capacity for solving problems in the school as a whole, good coordination among subsystems is essential. In many cases, existing structures for interfacing between groups will be adequate. In other cases, the effectiveness of existing structures will have to be improved, and in some cases entirely new structures will have to be built. In cases where an existing group (such as the conference of department heads) needs its effectiveness improved or a new structure for interfacing needs to be built, the interfacing group can proceed through Phases Two through Six in the same manner as any subsystem. If the interfacing groups have achieved strong skill in solving problems, developing skill in the interface itself will go much more rapidly than it did in the constituent groups; Phase Two, for example, might even race by in an hour or so.

One example of building an interfacing group where none existed before occurs when a school converts to team teaching and multiunit structure. An "instructional improvement committee" or conference of team leaders is then necessary. For narratives from two schools of the formation and functioning of committees of team leaders, see Chapters 4 and 5 of Schmuck, Murray, Smith, Schwartz, and M. Runkel (1975). Another example would be a liaison or steering committee of teachers and parents. Still another would be a committee of principals whose schools have common or interdependent problems.

Sometimes interfaces among interfaces are necessary. For example, a large school district divided into areas, each with its own associate superintendent, might have a liaison committee composed of an area administrator and a few principals from each of the areas. In a school, the principal and perhaps a few of his or her assistants act as interface among interfaces that connect subsystems. For example, the principal might keep the department heads and the teacher-parent liaison committee aware of matters that concern both interfaces.

System as a Whole

Solving problems at the level of the school as a whole requires special attention to four matters. First, some interfacing group (in a small school, a single person such as the principal will do) should be concerned with drawing out the resources of participants to be brought to bear on problem solving, making sure that valuable talents or access to resources are not lost. Sometimes a person assigned to one subsystem cannot offer much to the work of that subsystem, but could offer a great deal of another.

Second, diagnoses should be made periodically to see that exchanges of resources among participants are equitable. Is someone giving or getting more than a fair share to the extent that the imbalance is causing embarrassment or resentment?

Third, the efficacy of the coordination through interfaces should be monitored to make sure they are performing adequately. If efficacy falls, an appropriate phase of developing problem-solving capacity should be recycled.

Fourth, organizational structure should be reviewed periodically. As seems necessary after careful diagnosis and problem solving, functions of existing subsystems should be shifted to improve clarity and equalize burdens, new structures (usually interfaces) should be built, or old structures should be disbanded. Special attention should be given to variables 6 (complexity of the organization) and 8 (distribution of cooperative, competitive, and individual tasks). At the level of the school as a whole, variables 3, 4, and 5 can also be scrutinized and a decision made whether the condition of those variables should be adopted as problems to be worked on: the accessibility of appropriate expert services and technical information, the accessibility of financial resources, and the rate of turnover of staff in the school.

Institutionalization

If capacity for solving problems is to be sustained, the procedures for sustaining it must be institutionalized. That is, exercising and maintaining the four meta-skills must be a legitimate function of all subsystems, and officially supported occasions must be used to renew the meta-skills. Some of the occasions can be brief and merely touch the surface, such as debriefing at the end of faculty meetings. Other occasions should be massive, such as a week of diagnosis of the condition of the school, during which appropriate problem solving would be set in motion, before the school year opens. If a week goes by without someone calling for diagnosis (in whatever words), resource-gathering, synergistic action, or a review of the condition of those meta-skills in the school, then the school should undertake systematic diagnosis to ascertain whether the meta-skills are still lively. We do not mean that someone should be prowling the school making tallies. We merely mean that if anyone voices a worry about the school's skills, that worry should be brought to the attention of others at the earliest occasion, and a decision should be made whether to take on the matter as a problem.

Summary of the Chapter

When a problem-solving group decides it must undertake to change norms and role-relationships, many variables must be given attention in the planning, and the stages of the change project must be carefully scheduled. Change agents should also provide a reassuring background of stability as a frame against which the change takes place.

When a school undertakes to develop a sustainable capacity for solving problems, the change project usually becomes a large one. The long-term view is necessary, and more variables must be considered than would be necessary in a short project with a more limited purpose. We described 44 variables we think become important at one time or another during a change project; the list included the variables to which we gave special attention in Chapters 2, 3, and 4.

We laid out six phases of work that we think useful in designing and monitoring the progress of a change project. The work of solving problems and of developing skill in solving problems is cyclical, however, and we do not mean the phases to be a hard and fast schedule. As a checklist, however, we think they are very serviceable.

To readers who are members of schools or consultants to them, we hope we have conveyed both caution and optimism. Good intentions are not enough, and boundless energy is not enough. Persistence despite confusion and set-backs is important, perhaps more important than anything else, but that is not enough either. Good intentions, energy, and persistence must be put together with several other things: readiness, phasing, recycling, and the meta-skills. A good deal of skill must be developed if a school is to come to a sustained capacity for solving problems, but all that we have described can be done. In schools and among consultants, people are waiting who are eager for a new kind of life in schools, who can muster the energy, maintain the persistence, and learn the necessary skills. In some schools, important progress can be made in a couple of years. In others, the task is gargantuan. With due regard to the vicious circle that we described in Chapter 2, however, we believe that even the school most mired in difficulties can make some headway against them.

Summary of the Document

Very briefly, the argument here goes as follows.*

1. Many urban schools are caught in a vicious circle in which great numbers of person-hours are spent trying to reduce multiple and severe difficulties. The effort often brings little result, the disappointment brings both impatience and enervation, and the impatience and enervation make the next effort even less likely to succeed.

2. Although the problems of urban schools are many and varied in detail and in their local manifestations, solutions are typically crippled by very common maladies: choosing solutions at a level of the school or district different from the level where the solution must be carried out,

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*We are indebted to Terrence Deal for the outline of this summary.

omitting vitally involved people from the decision making, setting unrealistic schedules for carrying out the solution, using old norms of communication that hamper coordination, holding impoverished conceptions of humans and their organizations, using haphazard instead of systematic procedures for solving problems, and others.

3. Our experience in the DTA project confirmed some of our earlier ideas about change in schools, broadened our understanding of the ranges of variables to be found in urban schools, and loosened some of our conceptions of sequences.

4. On the basis of our experience in DTA, our earlier experience, and the reports of work of others, we believe the following kinds of knowledge and skill are necessary in schools if they are to reach a sustained capacity for solving problems:

a. knowledge of the complexities of humans and their school organizations.

b. collaborative skill in communication and in conducting work in meetings.

c. skill in a systematic procedure for solving problems.

d. skill in diagnosing organization conditions and processes.

e. skill in getting information and other resources from inside or outside the group.

f. skill in synergistic group action.

g. skill in monitoring the effectiveness of other skills listed here.

h. knowledge of variables affecting change in schools.

i. knowledge of the effects of using different sequences of action in change projects.

Envoi

As a summary of our vision of the skillful school, we borrow the words of Trist (1977, pp. 273-274):

> Any component system has a repertoire which can be put to many uses, so that increased adaptive flexibility is acquired. While this is true at the biological level, as for example in the human body, it becomes far greater at the organizational level where the components--individual humans and groups of humans--are themselves purposeful systems. Humans have the capacity for self-regulation, so that control may become internal rather than external. Only organizations based on the redundancy of functions have the flexibility and innovative potential to give the possibility of adaptation to turbulent conditions. For it is through this redundancy of functions that their response repertoire acquires "the requisite variety"--in Ashby's sense--to meet the increased variation emanating from the environment.
>
> From the analysis, a model would seem to be available, at least in outline, in terms of which organizations may be fashioned with some hope of surviving in a turbulent environment. They will tend to be socio-ecological rather than bureaucratic in their modes of regulation, with much local autonomy and a good deal of participation and democracy. Their parts will be mutually articulated rather than arranged in strict hierarchies. This change represents a move from a coercive toward a negotiated order, the establishment and maintenance of which depend on collaboration.

And to express our feeling of what life can be like in a skillful school, we borrow the words of John Maynard Keynes, as quoted by Stavrianos (1976, p. 196):

All kinds of social customs and economic practices affecting . . . rewards and penalites, which we now maintain at all costs, . . . we shall then be free, at last, to discard. . . . We shall once more value ends above means and prefer the good to the useful. We shall honour those who can teach us how to pluck the hour and the day virtuously and well, the delightful people who are capable of taking direct enjoyment in things. . . . But, of course, it will happen gradually, not as a catastrophe. Indeed, it has already begun.

Appendix

STRATEGIES FOR CONSULTANTS

In recent years, an important body of literature has accumulated on strategies of consultation--the transmission of know-how--and it is still growing. The findings from the research and field trials show an impressive agreement on the best ways for consultants to assist schools in solving problems. We will summarize the findings briefly.

We will not cite all the relevant literature.* We will mention here the reports we believe to contain the highest concentrations of findings. Most of the reports we mention come from rather large-scale programs of work incorporating large amounts of experience. We will describe each finding briefly and display a summary table at the end.

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*Further reports of empirical evidence are listed and annotated by Runkel and Burr (1977); they are indexed there under "interventions."

The reports come from the League of Cooperating Schools,[1] the program on Strategies of Organizational Change at CEPM,[2] the work of the Center for New Schools,[3] a series of studies by Berman and others,[4] the National Diffusion Network,[5] the Pilot State Dissemenation Project,[6] a report by Glaser and Taylor (1973), a report by Hammond and Todd (1975), a "distillation of research" compiled for NIMH by the Human Interaction Research Institute (1977), and a review of studies of technical innovations by Yin and others (1976).

The studies mentioned above are almost unanimous in saying that if consultants are to be effective, they must work locally, face to face with the local people, not at long distance via mailed materials, and not with an occasional dip-in-and-out visit. They are almost unanimous in saying that consultants must expect to stay at work for a long period. A year is minimum for most kinds of assistance, and serious organizational change may require two or three years or even more.

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[1] See, for example, Bentzen and associates (1974), Goodlad (1975), and Tye and Novotney (1975).

[2] See, for example, Schmuck and Runkel (1970), Schmuck, Murray, Smith, Schwartz, and M. Runkel (1975), Runkel, Wyant, and Bell (1975), Schmuck, Runkel, Arends, and Arends (1977), and Runkel and Schmuck (in press).

[3] See, for example, Center for New Schools (1973a, 1973b, 1975).

[4] See, for example, Berman and McLaughlin (1975a), Mann (1976), and Berman and others (1977).

[5] See Emrick, Peterson, and Agarwala-Rogers (1977). See also Far West Laboratory for Research and Development (1976) and Emrick and Peterson (1977); the latter also surveys Sieber, Louis, and Metzger (1972), Berman, McLaughlin, and others (1975b and 1977), and two other studies.

[6] See Sieber, Louis, and Metzger (1972) and Louis (1977).

The studies are unanimous in saying that consultants must join with school participants from the outset in collaborative planning, and they should share the task of monitoring progress and evaluating its quality with the local people.

The studies are almost unanimous in describing the necessity for mutual adapation; the studies by Berman and others are most explicit about this. Consultants must not suppose that the participants can accept the plans, schedules, strategies, or other ways of working that the consultants bring with them. They must expect that participants will adapt incoming ideas to their own local conditions. Similarly, the participants must expect to alter some of their local ways of working to suit the consultants' methods. Both the school participants and consultants must change to some extent to find a common ground for work.

Most of the research warned that materials, "packaged" or not, must be altered and adapted to the participants' way of working. Sometimes such thorough-going alterations are necessary that it is useful to let participants "re-invent the wheel."

Most of the studies said that in-service training is necessary if participants are to succeed in making the new way of doing things work. Several studies pointed especially to training intergrally tied to participants' regular work meetings--both training in doing the actual convening tasks and training in conducting effective meetings.

Most of the studies described the importance of social support. People must not feel they are working alone. Public support from superiors is important, but is also important that participants gather frequently and express their continued commitment to the project. Half the studies went farther than that and placed strong importance on making explicit arrangements for the phase of instutitionalization.(or incorporation). That includes preparing participants for the departure of the consultants and providing some consultation as the participants move into the stable phase.

Four of the ten studies pointed out the strong effects of the way the consultants model, or fail to model, and the kinds of norms they urge upon the participants. A certain amount of learning occurs by imitation, and the participants can imitate the consultants best if the consultants' actions suit their words.

Two of the programs of study we have cited were studies of other kinds of organizations than schools. Glaser and Taylor (1973) reported on community mental health projects. An organization for community mental health has some important similarities to a school; goals are often multiple and not very clear, the "product" is intangible, and some important constituencies are very hard to identify and reach. Schools are more similar to mental health organizations than they are to industrial organizations.

Hammond and Todd (1975) reported on technical aid to underdeveloped countries. That kind of project has some similarities to those in schools; norms must change new communication networks must be built, clients must learn to use materials new to them, and clients must acquire new techniques. An international project is especially similar to work in a large school or district; the consultants cannot work with the entire body of clients at once, but must thread their way intricately from one group to another.

One study (Yin and others, 1976) examined 140 case studies that included schools, police departments, hospitals, public work departments, planning agencies, and the like. One of their conclusions, interestingly, echoes one of NIE's reasons for funding DTA. They say, ". . . our suggestion is that federal support be undertaken with a capacity-building rather than a case-specific objective" (p. xi).

The findings described above are summarized in Table A-1. An "X" indicates that the program of work named in the heading on the column gave clear evidence of the effectiveness of the way of working labelling the row. It seems reasonable to conclude that the principles listed are important and fairly universal. None of the programs of study found evidence opposed to any principle; the principles applied in a great many schools, and they applied in some organizations other than schools.

Table A-1. Effective strategies for consultants and some literature in support of them.

	League of Coop'ng Schools	CEPM	CNS	Berman et al.	Nat'l Diff'n Network	Pilot State Dissem	Glaser and Taylor	Hammond and Todd	HIRI	Yin et al.
Work locally and long	x	x	x	x	x	x	x	x	x	
Involve local people in planning and monitoring	x	x	x	x	x	x	x	x	x	x
Adapt mutually	x	x	x	x	x	x	x	x	x	
Adapt materials	x	x	x	x	x	x				
Provide in-service training	x	x	x	x	x			x		x
Include an explicit phase of institutionalization	x	x	x	x	x					x
Let consultants model action	x	x	x				x			

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